

SHIP PRODUCTION COMMITTEE
FACILITIES AND ENVIRONMENTAL EFFECTS
SURFACE PREPARATION AND COATINGS
DESIGN/PRODUCTION INTEGRATION
HUMAN RESOURCE INNOVATION
MARINE INDUSTRY STANDARDS
WELDING
INDUSTRIAL ENGINEERING
EDUCATION AND TRAINING

April 1, 1996
NSRP 0507
N6-94-1

THE NATIONAL SHIPBUILDING RESEARCH PROGRAM

World Class U.S. Shipbuilding Standards

Task 3:

Catalog of Foreign Standards for Common Systems and Ship Types

U.S. DEPARTMENT OF THE NAVY
CARDEROCK DIVISION,
NAVAL SURFACE WARFARE CENTER

in cooperation with
National Steel and Shipbuilding Company
San Diego, California

| Report Documentation Page | | | | Form Approved OMB No. 0704-0188 | |
|--|------------------------------------|-------------------------------------|--|--|---------------------------------|
| Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. | | | | | |
| 1. REPORT DATE 01 APR 1996 | | 2. REPORT TYPE N/A | | 3. DATES COVERED - | |
| 4. TITLE AND SUBTITLE The National Shipbuilding Research Program, World Class U.S. Shipbuilding Standards Task 3: Catalog of Foreign Standards for Common Systems and Ship Types | | | | 5a. CONTRACT NUMBER | |
| | | | | 5b. GRANT NUMBER | |
| | | | | 5c. PROGRAM ELEMENT NUMBER | |
| 6. AUTHOR(S) | | | | 5d. PROJECT NUMBER | |
| | | | | 5e. TASK NUMBER | |
| | | | | 5f. WORK UNIT NUMBER | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Surface Warfare Center CD Code 2230-Design Integration Tower Bldg 192, Room 128 9500 MacArthur Blvd Bethesda, MD 20817-5000 | | | | 8. PERFORMING ORGANIZATION REPORT NUMBER | |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | | | | 10. SPONSOR/MONITOR'S ACRONYM(S) | |
| | | | | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) | |
| 12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited | | | | | |
| 13. SUPPLEMENTARY NOTES | | | | | |
| 14. ABSTRACT | | | | | |
| 15. SUBJECT TERMS | | | | | |
| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT SAR | 18. NUMBER OF PAGES 95 | 19a. NAME OF RESPONSIBLE PERSON |
| a. REPORT unclassified | b. ABSTRACT unclassified | c. THIS PAGE unclassified | | | |

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**WORLD CLASS U.S. SHIPBUILDING
STANDARDS**

**NSRP 6-94-1
Task 3**

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NSRP 6-94-1
World Class U.S. Shipbuilding
Standards
Task 3

1. INTRODUCTION.

This report/database was developed under Project NSRP 6-94-1, World Class U.S. Shipbuilding Standards (Task 3). Task 3 (after several changes in guidance due to lack of availability of standards) was to look at four specific areas (Ventilation, Electrical, Piping and Structure) from which a matrix database was to be developed that cross-referenced 4 ship types (RO-RO, LNG, Ferries, Tankers) to standards supporting the desired domain (see below).

The ventilation area was to address hangers and ventilation fittings; the electrical area was to address hangers and tray systems; the piping area was to address hangers, firemain, and fittings (select a few); and the structure area was to address components, ladders, and handrails. For each of these areas, standards were identified from either an existing paper index or digital database.

Once standards were identified an attempt was made to get copies of the standards from MARAD since funding to purchase standards was not included in the tasking. MARAD had indicated in several SP-6 meetings that they had access to a significant number of standards and would make them available for various uses (uses were limited since most standards have COPYRIGHT restrictions). As will be seen, there were a significant number of standards that were identified but were not available from MARAD from a variety of reasons (funding being the most significant; government shutdowns were also a factor).

Standards are costly. The University of Michigan has developed a database of marine standards that approaches 17,000 items. Based on a typical average cost of about \$40-50 per standard the cost to obtain all of these standards would probably exceed \$500,000. Not only are standards costly but determining which ones you actually need is difficult since abstracts of standards are rarely available so selection has to be done from a brief title.

Selecting standards was done from a brief title provided in the standard index (digital and paper bound indexes were used). Since some titles are vague there were standards requested that were not applicable to this particular study. For those standards that were applicable, a brief abstract detailing the contents of the standard was also included as part of the matrix. Since access to standards was difficult, to say the least, in some cases abstracts of standards were included if they were even remotely associated with the task.

Selecting standards to include in this study was accomplished in a variety of ways. The two most significant were use of SWBS and "key words". The following SWBS/keywords were used in the indicated area:

Electrical: 300,304,321,322,330,331,340/hanger, tray

| | |
|-------------|---|
| Ventilation | 509,511,512,513,514/hanger, fitting, duct |
| Piping | 252,255,256,260,261,262,264,505,508,521,522,523, 524,526,528,529,530,531,532,533,534,535,536,541, 544,545,546,558/hanger, firemain, fire main, fittings |
| Structure | 600,610,611,612,623,690/padeye, ladder, handrail, stanchion Lifeline, chock, cleat, bollard, davit, jackstaff, bit |

Once a standard was selected several items of information (digital database fields) were selected to provide enough information about the standard so a user could determine if this particular standard was applicable to their desired application. The selected fields were: SWBS, Organization (responsible for the standard), Standard Number, Title, Abstract, English (language), Date (standard issue date), and Ship Applicability. Under Ship Applicability there were 4 classes of ships addressed: 1 - RO-RO; 2 - LNG; 3 - Ferry; and 4 - Tankers. As can be seen from the report, most standards are applicable to all 4 ship types.

Both a digital database of the matrix and a paper print out are being provided. Each of the four principle areas, Electrical, Piping, Ventilation and Structure have a floppy provided with 4 files. These four files represent: Database file (xxxxxx.dbf), Report file (xxxxxx.frx), Memo file (abstract) (xxxxxx.fpt), and associated Report file (xxxxxx.frt). The digital databases are being provided to allow the user to keep the database up to date if desired.

The database and associated reports were developed using FoxPro 2.6. Most good database software packages (like dBASE, etc) should be able to manipulate the provided database. Should you use a database manager software package other than FoxPro you may have to use that particular software package to develop reports. Report files are not always compatible from software package to software package as are the xxxxxx.dbf files.

A copy of the abbreviations used in the "Organ" (Organization) Field are also provided to make it easier to determine who some of the players are.

A copy of a MARAD price list for some foreign standards is also provided to give some insight into the cost of standards. The costs shown are for individual standards. Access to standards can also be achieved through various service bureaus that provide digital data on optical discs. Due to the large number of standards typically available on optical discs the costs for such access can approach ten to hundred's of thousands of dollars.

2. SUMMARY.

A lot of insight was gained about standards in general while developing this report. The stated observations were made from a limited view of all possible standards and may not always be true from a larger perspective. It is believed that the following observations can be beneficial when taken within the context provided.

- a. The JIS (Japanese Industrial Standards) are very thorough and cover a multitude of areas. Their one possible short-coming is that most of their standards are largely graphics (drawings, tables, etc) with very little associated text to describe the process (at least this is true in the English versions made available for use in this project). A large number of standards from other countries have been developed utilizing the JIS as a starting point or in some cases a direct copy of the JIS standard is used with the particular country substituting their name for JIS.
- b. The International Standard Organization (ISO) continues to develop more and more standards. Most ISO standards appear to be a compilation of data from numerous sources and are, in general, very detailed. You frequently find that where ISO standards are available a large number of countries adopt them vice having their own standard. In a lot of cases it appears that a given country will abandon their existing standard for the ISO standard. This is so prevalent that a user of international standards might want to look at ISO first to see if they have a standard available vice looking at numerous other country's standards
- c. Det Norske Veritas (DNV) standards are very thorough and detailed. The English translated standards used for this project were easily read and understandable -- this not being the case for all translated foreign standards. The DNV standards would be high on any list where a grouping of standards were being developed for study/utilization.
- d. The BSI (British Standards Institution) standards utilized in this effort were frequently adopted from ISO standards (where ISO standards existed).
- e. The Bundesam (BUND) and Deutsches Institute fur Normung (DIN) (German Standards) were generally not available in English translated versions so little can be said about these standards.

3. STANDARDS COMPENDIUM.

Standards Organizations and Sources in Database

| | |
|-----------------|---|
| ABS | American Bureau of Shipping Rules for Building and Classing Steel Vessels |
| ABS01 | Nondestructive Inspection of Hull Welds |
| ABS02 | Approved Welding Electrodes Wire-Flux & Wire Gas Combinations |
| ABS03 | Offshore Mobile Drilling Units |
| ABS04 | Steel Barges for Offshore Service |
| ABS05 | Bulk Carriers for Service on the Great Lakes |
| ABS06 | River Rules '71 |
| ABS07 | Inert Gas Installations on Vessels Carrying Oil in Bulk |
| ABS08 | Certification of Cargo Containers |
| ABS09 | Manual for Making Bronze Propeller Repairs |
| ABS10 | Repair, Welding, Cladding & Straightening of Tail Boilers |
| ABS11 | Burning Crude Oil & Slops in Main & Auxiliary Boilers |
| ABS12 | Steel Floating Drydocks |
| ABS13 | Underwater Inspection in Lieu of Drydocking Survey |
| ABS14 | Construction of Shipboard Elevators |
| ABS15 | Certification of Construction & Survey of Cargo Gear on Merchant Vessels |
| ABS16 | Certification of Self-Unloading Cargo Gear on Great Lakes Vessels |
| ABS17 | Single Point Moorings |
| ABS18 | Aluminum Vessels |
| ABS19 | Classifications of Nuclear Ships |
| ABS20 | Submersible Vessels |
| ABYC | American Boat and Yacht Council, Incorporated |
| AFNOR | Association Francis de Normalization (France) |
| AMCA | Air Moving and Conditioning Association, Incorporated |
| ANSI | American National Standards Institute |
| API | American Petroleum Institute |
| ASTM | American Society for Testing and Materials |
| BSI | British Standards Institute |
| Bundesam | German Standards |
| CGNVIC | U.S. Coast Guard Navigation and Vessel Inspection Circular |
| DEF-S | British Defense Standards |
| DIN | Deutsches Institute fur Normung (Germany) |
| DOD | Department of Defense |
| DOL | Department of Labor |
| EPA | Environmental Protection Agency |
| FCI | Fluid Controls Institute, Incorporated |
| FED-SPEC | Federal Specification |
| GL | Germanisher Lloyd |
| HEI | Heat Exchange Institute |
| HI | Hydraulic Institute |
| IEC | International Electrotechnical Commission |

3. STANDARDS COMPENDIUM. (Continued)

| | |
|--------------|---|
| IEEE | Institute of Electrical and Electronics Engineers, Incorporated |
| IES | Illuminating Engineering Society |
| IMCO | Intergovernmental Maritime Consultive Organization |
| IPCEA | Insulated Power Cable Engineers Association |
| ISO | International Organization for Standardization |
| JIC | Joint Industrial Council |
| JIS | Japanese Industrial Standards |
| MARAD | Maritime Administration |
| MASS | MARAD Standard Specification |
| MASSD | MARAD Standard Specification - Diesel |
| MIL | Military Specification |
| MSS | Manufacturers Standardization Society of the Valve & Fittings Industry |
| NBS | National Bureau of Standards |
| NEMA | National Electrical Manufacturers Association |
| NFPA | National Fire Protection Association |
| NNI | Netherlands Normalisatie Institute |
| OCMIF | Oil Companies International Marine Forum |
| PCC | Panama Canal Company |
| SAA | Standards Association of Australia |
| SCA | Suez Canal Authority |
| SNAME | Society of Naval Architects and Marine Engineers |
| SOLAS | Safety of Life at Sea |
| SSPC | Steel Structures Painting Council |
| TEMA | Tubular Exchanger Manufacturers Association |

4. ORGANIZATION ABBREVIATIONS.

Database Maintenance

| | |
|---|----------|
| Air Movement and Control Association | AMCA |
| American Bureau of Shipping | ABS |
| American Boat and Yacht Council, Inc. | ABYC |
| American Gear Manufacturers Association | AGMA |
| American Iron and Steel Institute | AISI |
| American Society of Civil Engineers | ASCE |
| American Society of Heating, Refrigerating and Air Conditioning, Inc. | ASHRAE |
| American Society of Mechanical Engineers | ASME |
| American Trucking Association | ATA |
| American Wood Preservers Association | AWPA |
| American National Standards Institute | ANSI |
| American Petroleum Institute | API |
| American Society for Testing and Materials | ASTM |
| Audio Engineering Society | AES |
| British Defense Standards; Def-S | MOD UK |
| British Standards Institution | BSI |
| Bundesam | BUND |
| Canadian General Standards Board | CGSB |
| Canadian Standards Association | CSA |
| Chemical Fabrics and Film Association, Inc. | CFFA |
| Chemical Specialties Manufacturers Association | CSMA |
| Chinese National Standards | CNS |
| Civil Aviation Authority | CAA |
| Civil Engineering Data | CED |
| Conference Europeene des Administrations des Postes et des Telecommunication | CEPT |
| Copper Development Association, Inc. | CDA |
| Cordage Institute | CI |
| Corps of the Engineers | COE |
| Data Interchange Standards Association | DISA |
| Department of Defense | DOD |
| Department of Labor | DOL |
| Det Norske Veritas | DNV |
| Deutches Institute fur Normung | DIN |
| Electronic Industries Association | EIA |
| Environmental Protection Agency | EPA |
| European Committee for Standardization | CEN |
| European Committee for Electrotechnical Standardization | CENELEC |
| European Council/Commission Legislative Documents | EC |
| European Telecommunications Standards Institute | ETSI |
| Federal Controls Institute, Inc. | FCI |
| Federal Specification | FED-SPEC |

5. STANDARD PRICING DATA (MARAD)

| <u>ORG.</u> | <u>DOCUMENT</u> | <u>COST</u> | <u>ORG.</u> | <u>DOCUMENT</u> | <u>COST</u> |
|-------------|-----------------|-------------|-------------|-----------------|-------------|
| BUNDESAM | VG 88900 TEIL 1 | \$46.50 | DIN | 81710 | \$56.50 |
| BUNDESAM | VG 88900 TEIL 2 | \$46.50 | DIN | 83200 | \$46.50 |
| JIC | EGP-1 E13 | \$ | DIN | 83202 TEIL 1 | \$46.50 |
| JIC | EMP-1 E13 | \$ | DIN | 83202 TEIL 2 | \$46.50 |
| ABS | 06 4.6 | \$ | DIN | 83202 TEIL 3 | \$46.50 |
| AFNOR | NF J83-211 | \$ | DIN | 83203 | \$ |
| AFNOR | NF J83-241 | \$ | DIN | 83204 | \$46.50 |
| AFNOR | NF J83-242 | \$ | DIN | 83205 | \$66.00 |
| AFNOR | NF J83-243 | \$ | DIN | 83206 | \$47.50 |
| AFNOR | NF J32-404 | \$ | DIN | 83207 | \$46.50 |
| AFNOR | NF J32-410 | \$ | DIN | 83208 | \$46.50 |
| AFNOR | NF J32-415 | \$ | DIN | 83209 | \$56.50 |
| AFNOR | NF J32-440 | \$ | DIN | 83210 | \$47.50 |
| AFNOR | NF J32-441 | \$ | DIN | 83214 | \$47.50 |
| AFNOR | NF J32-442 | \$ | DIN | 83215 | \$66.00 |
| ANSI | 14.3 | \$86.50 | DIN | 83216 | \$47.50 |
| BUNDESAM | VG 85194 | \$? | DIN | 83217 | \$47.50 |
| BUNDESAM | VG 85195 | \$? | DIN | 83218 | \$66.00 |
| BUNDESAM | VG 85204 | \$47.50 | DIN | 83224 | \$47.50 |
| BUNDESAM | VG 85207 | \$56.50 | DIN | 83225 | \$47.50 |
| BUNDESAM | VG 85209 | \$46.50 | DIN | 83226 | \$47.50 |
| BUNDESAM | VG 85210 | \$66.00 | DIN | 83505 | \$47.50 |
| BUNDESAM | VG 85211 TEIL 1 | \$46.50 | DIN | 83510 | \$47.50 |
| BUNDESAM | VG 85211 TEIL 2 | \$46.50 | JIS | F 2621 | \$ |
| BUNDESAM | VG 85212 | \$46.50 | JIS | F 2622 | \$ |
| BUNDESAM | VG 85213 | \$46.50 | JIS | F 7502 | \$ |
| BUNDESAM | VG 85214 | \$46.50 | SAA | AS 1035 | \$ |
| BUNDESAM | VG 85215 | \$46.50 | SAA | AS 1036 | \$ |
| BUNDESAM | VG 85216 TEIL 1 | \$46.50 | SAA | AS 1037 | \$ |
| BUNDESAM | VG 85216 TEIL 2 | \$46.50 | SAA | AS 1986 | \$ |
| BUNDESAM | VG 85217 | \$46.50 | ANSI/ASME | B16.13 | \$ |
| BUNDESAM | VG 85222 TEIL 1 | \$47.50 | BUNDESAM | VG 85570 TEIL 1 | \$ |
| BUNDESAM | VG 85222 TEIL 2 | \$47.50 | BUNDESAM | VG 85570 TEIL 2 | \$ |
| BUNDESAM | VG 85222 TEIL 3 | \$? | DIN | 86014 | \$47.50 |
| BUNDESAM | VG 85223 TEIL 1 | \$56.50 | DIN | 86016 | \$47.50 |
| BUNDESAM | VG 85223 TEIL 2 | \$46.50 | DIN | 86061 | \$46.50 |
| BUNDESAM | VG 85223 TEIL 3 | \$46.50 | DIN | 86063 | \$46.50 |
| BUNDESAM | VG 85224 | \$46.50 | DIN | 86064 | \$46.50 |

ELECTRICAL

| Page | 1 | | | | | | |
|------|----------|----------------|--|--|---------|-----------|-----------|
| SWBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App. |
| 300 | JIC | EGP-1 E13 | CONDUIT AND FITTING; WIREWAY | Standard not available from MARAD. | Y | | |
| 300 | JIC | EMP-1 E13 | CONDUIT AND FITTING; WIREWAY | Standard not available from MARAD. | Y | | |
| 300 | NEMA | VE 1 | CABLE TRAY | This standard provides technical requirements concerning the construction, test, and performance of metal cable tray systems. It covers manufacturing standards such as material, finishes, dimensions, tray types and uses, protection of cable insulation, testing, etc. CAUTION: Some portions of this standard may not be directly applicable to marine service. | Y | 1991 | 1,2,3,4 |
| 300 | USCG | 46C111.59 | ELECTRIC SYSTEMS-GENERAL REQUIREMENTS-BUSWAYS | This standard requires that each busway must meet: Article 364 of the NEC; and UL 857 requirement. | Y | | 1,2,3,4 |
| 300 | ANSI/IEE | 45 | Recommended practice for electrical installations on shipboard | These IEEE marine recommendations are intended to serve as a guide for the selection and installation of equipment on merchant vessels with electric apparatus for lighting, signaling, communications, power and propulsion. Section 20 (Cable Installation) provides general guidance for installation, continuity, grounding, location, radius of bends, pulling force, cable protection etc. Section 20.5 (Cable support and Retention) provides guidance as to how cables installed in groups should be supported (hangers, straps, clips, etc.). | Y | 1983 | 1,2,3,4 |
| 300 | BUNDESAM | VG88515 TEIL 1 | MOUNTING RAILS; G-PROFILE; NON MAGNETIC, FOR TERMINAL BLOCKS | Standard not available from MARAD. | Y | | |
| 300 | DNV | 04.04.02 | ELECTRICAL INSTALLATIONS; DESIGN PRINCIPLES | Part 4, Chapter 4, Section 2 (Design Principles) covers a variety of subjects | Y | 7/93 | 1,2,3,4 |

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|-----|-------|----------|---|--|---------|--------------|-------------|--|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | | including: Environmental conditions, vibrations and accelerations, ambient air temperatures, cooling water temperatures, explosion-protected equipment, cable entrances, grounding connections, lightning protection, insulating materials for cables, terminal connections, etc. | | | | |
| 00 | DNV | 04.05.02 | ELECTRCIAL INSTALLATIONS; DESIGN PRINCIPLES | Part 4, Chapter 5, Section 2 (System Design) provides design information on a vartiet of subjects such as: Automatic control systems, alarm systems, safety systems, indicating and recording systems, remote control systems, sequence control systems, programmable electronic systems (fault monitoring, EMI, LAN, system integrity, etc.) | Y | 7/93 | 1,2,3,4 | |
| 00 | DNV | 04.05.05 | ELECTRICAL INSTALLATIONS; COMPONENT DESIGN AND INSTALLATION | Standard not available from MARAD. | Y | | | |
| 00 | DNV | 04.05.06 | ELECTRICAL INSTALLATIONS; USER INTERFACE | Standard not available from MARAD. | Y | | | |
| 00 | DNV | 05.03.08 | OIL CARRIERS; ELECTRICAL INSTALLATIONS | Part 5, Chapter 3, Section 8 (Electrical Installations) provides specific design criteria for tankers designed to carry oil cargoes in bulk (flash point not over 60.5 degrees). Some specific subjects are: electrical installation in gas-dangerous zones and spaces, basic requirements (grounding, distribution, cables and cable installation), installation in gas-safe spaces in the cargo area and adjacent to this area, etc. | Y | 7/93 | 4 | |

ELECTRICAL

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| <u>WBS</u> | <u>Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|---------------|--|--|----------------|----------------------|---------------------|
| 00 | DNV | 05.04.12 | CHEMICAL CARRIERS; ELECTRICAL INSTALLATIONS | Part 5, Chapter 4, Section 12 (Electrical Installations) provides design criteria for chemical tankers. Subjects discussed follow: Installation in gas-dangerous spaces, installation in gas dangerous zones on the open deck, installations in gas safe spaces in the cargo area and adjacent to this area, cable requirements, etc. | Y | 7/93 | 4 |
| 00 | DNV | 05.05.12 | LIQUIFIED GAS CARRIERS; ELECTRICAL INSTALLATIONS | Part 5, Chapter 5, Section 12 (Electrical Installations) provides design criteria for Liquefied Gas Tankers. Specific subjects follow: Installations in gas-dangerous spaces, general cable requirement, installation in gas-dangerous zones on the open deck, Installation in gas-safe spaces in the cargo area and adjacent to this area, grounding requirements, etc. | Y | 7/93 | 2 |
| 00 | DNV | 05.09.07 | OIL PRODUCTION AND STOWAGE VESSELS; ELECTRICAL INSTALLATIONS | Part 5, Chapter 9, Section 7 (Electrical Installations) provides general design criteria for most merchant vessels. Subjects addressed: Powers supply systems, emergency power supply, cables, equipment and cables in hazardous areas, etc.. Cable criteria discussed separating of main and emergency power cables (i.e. not in the same tray), and intrinsically safe and non-intrinsically safe cables are to be kept separate, etc. | Y | 7/93 | 1,2,3,4 |
| 00 | IEC | 92 PT101 | ELECTRICAL INSTALLATIONS IN SHIPS PART 101: DEFINITIONS AND GENERAL REQUIREMENTS. THIRD EDITION; (AMEND. 1-1984) (AMEND 2-1987) | This IEC standard provides definitions and general requirements for electrical installation in ships. Some subjects covered follow: Voltage and frequency | Y | 1994 | 1,2,3,4 |

ELECTRICAL

| Page | 4 | | | | | | | |
|------|-------|---------------|--|--|---------|-----------|----------|--|
| SWBS | Organ | Std-No | Title | Abstract | English | Orig Data | Ship App | |
| | | | | variations, cable entries, environmental conditions, materials, applicability of the standard to AC and DC, maximum loads, insulation, safety requirements, etc. | | | | |
| 300 | IEC | 92 PT 201 | ELECTRCIAL INSTALLATIONS IN SHIPS PART 201; SYSTEM DESIGN, GENERAL FOURTH EDITION. | This IEC standard addresses general system design criteria (Electrical installation in ships). Some subjects discussed: D.C. distribution systems, A.C distribution systems, safety, sources of electrical power for auxiliary services, balance of loads, lighting circuits, navigation lights, radio installation, motor circuits, internal communications systems, etc. | Y | 8/94 | 1,2,3,4 | |
| 300 | IEC | IEC92-502*CEI | ELECTRICAL INSTALLATIONS IN SHIPS. PART 502; SPECIAL FEATURES: TANKERS | This IEC standard provides guidance for electrical installations in ships (tankers). Some subjects addressed: definitions, hazardous areas, electrical equipment in hazardous areas, particular conditions applicable to Type A, B, C, & D tankers, cargos detrimental to electrical equipment, chemically unstable or reactive cargoes, etc. | Y | 10/94 | 4 | |
| 300 | IEC | IEC92-504*CEI | ELECTRCIAL INSTALLATIONS IN SHIPS. PART 504; SPECIAL FEATURES: CONRTROL AND INSTRUMENTATION. | This IEC standard provides guidance for Electrical Installations in ships (Special Features -- Control and Instrumentation). Some topics discussed: definitions, operation, reliability, stability, electromagnetic compatibility, circuit design, testing, voltage and frequency variations, installation and ergonomics, safety systems, machinery control installations, automatic starting | Y | 9/94 | 1,2,3,4 | |

ELECTRICAL

| Page | 5 | | | | | | |
|------|--------|--------------|---|---|---------|-----------|----------|
| SWBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
| | | | | installation for electrical power supplies, machinery alarm installations, etc. | | | |
| 300 | IEEE | 45-43 | HAZARDOUS LOCATIONS, ELECTRICAL INSTALLATIONS IN ELECTRICAL EQUIPMENT IN HAZARDOUS LOCATIONS | Standard not available from MARAD. | Y | | |
| 300 | JIC | EGP-1 E13 | CONDUIT AND FITTING; WIREWAY | Standard not available from MARAD. | Y | | |
| 300 | JIS | F8061 | ELECTRICAL INSTALLATIONS IN SHIPS PART 101: DEFINITIONS AND GENERAL REQUIREMENTS. | Standard not available from MARAD. | Y | | |
| 300 | JIS | F8062 | ELECTRICAL INSTALLATIONS IN SHIPS PART 201: SYSTEM DESIGN, GENERAL (IEC 92-201-1980) | Standard not available from MARAD. | Y | | |
| 300 | MOD UK | NES 503 | REQUIRMENTS FOR ELECTRICAL INSTALLATION CABLING DIAGRAMS AND ASSORTED DATA ISSUE 2 (08.88) | Standard not available from MARAD. | Y | | |
| 300 | NNI | NEN10092-101 | ELECTRICAL INSTALLATIONS IN SHIPS PART 101, DEFINITIONS AND GENERAL REQUIRMENTS | Standard not available from MARAD. | Y | | |
| 300 | NNI | NEN10092-502 | ELECTRICAL INSTALLATIONS IN SHIPS; PART 502: TANKERS | Standard not available from MARAD. | Y | | |
| 300 | NNI | NEN10092-503 | ELECTRICAL INSTALLATIONS IN SHIPS; PART 503: AC SUPPLY SYSTEMS WITH VOLTAGES IN THE RANGE ABOVE 1 KV UP TO AND INCLUDING 11 KV. | Standard not available from MARAD. | Y | | |
| 300 | NNI | NEN10092-504 | ELECTRICAL INSTALLATIONS IN SHIPS; PART 504: CONTROL AND INSTRUMENTATION. | Standard not available from MARAD. | Y | | |
| 304 | ABS06 | 10.28.4 | HARZARDOUS LOCATION, CABLE INSTALLATIONS ELECTRICAL EQUIPMENT, | Standard not available from MARAD. | Y | | |

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| WBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App. | |
| | | | RIVERS AND IC, CABLE BEHIND SHEATHING, PANELING, FIXTURES, ELECTRICAL EQUIPMENT, RIVERS AND IC | | | | | |
| 104 | ABS06 | 10.34.2 | CABLE INSTALLATION, BULK OIL CARRIERS, ELECTRICAL EQUIPMENT, RIVERS AND IC | Standard not available from MARAD. | Y | | | |
| 104 | Bundesam | VG 88900 Teil | Punched profiles for cable ways; straight cable ways | Standard not available from MARAD. | N | 1979-09 | | |
| 104 | Bundesam | VG 88900 Teil | Punched profiles for cable ways; cable way bends | Standard not available from MARAD. | N | 1980-06 | | |
| 104 | DOD | DOD-HDBK-282 | FIBER OPTIC CABLE INSTALLATION PROCEDURES | This standard has been cancelled. | | | | |
| 104 | MASS | 90.06 | ELECTRIC CABLE INSTALLATION | This standard provides guidance as to: how to run cables; wireways and support materials, painting, construction, etc; cable penetrations; cableway locations; cables for critical circuits, etc. | Y | Draft'95 | 1,2,3,4 | |
| 104 | MASSD | 90.06 | ELECTRIC CABLE INSTALLATION | This standard provides guidance as to: how to run cables; wireways and support materials, painting, construction, etc; cable penetrations; cableway locations; cables for critical circuits, etc. for Diesel merchant ship construction. | Y | Draft'95 | 1,2,3,4 | |
| 104 | USCG | 46C111.60A | CABLE, ELECTRIC, PENETRATIONS, DECK & BULKHEAD, ELECTRIC CABLE INSTALLATIONS | Standard not available from MARAD. | Y | | 1,2,3,4 | |
| 104 | CNS | C3161 | METHOD OF TEST FOR CABLES AND FLEXIBLE CORDS FOR ELECTRICAL EQUIPMENT OF SHIPS (APR) 9125 | Standard not available from MARAD. | Y | | | |
| 104 | CNS | F5045 | MARINE CABLE GLANDS FOR BULKHEAD AND | Standard not available from MARAD. | Y | | | |

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| SWBS | Organ | Std-No. | Title | Abstract | English | Orig Data | Ship App | |
| | | | DECK (JAN) 9854 | | | | | |
| 304 | CNS | F5047 | ELECTRICAL CABLE HANGERS AND SADDLES FOR MARINE USE (JAN) 9856 | Standard not available from MARAD. | Y | | | |
| 304 | DNV | 04.04.07 | ELECTRICAL INSTALLATIONS; CABLES | Part 4, Chapter 4, Section 7 provides general guidance for electrical cables for ship board installations. Subjects discussed: Construction, Testing, insulating materials, wire braid and armour, conductors, protective sheaths, instrumentation and communication cables, control cables, etc. | Y | 7/93 | 1,2,3,4 | |
| 304 | DNV/HSLC | 04.03.07 | ELECTRICAL INSTALLATIONS; CABLES | Standard not available from MARAD. | Y | | | |
| 304 | DNV/MOU | 04.04.07 | ELECTRICAL INSTALLATIONS; CABLES | Standard not available from MARAD. | Y | | | |
| 304 | DOD | DOD-2003-1 | ELECTRICAL PLANT INSTALLATION STANDARD METHODS FOR SURFACE SHIPS AND SUBMARINES (CABLE) SECTIUON 1 OF 5. | This DOD standard (Section 1 of 5 sections) provides guidance for Electric Plant Installation Standard Methods for Surface Ships and Submarines (Cable). This standard disseminates up-to-date information for cable preparation, end sealing, entry to equipment and connectors, repair, cable tagging, and splicing for Navy vessels. | Y | 24 June | Navy | |
| 304 | DOD | DOD-2003-2 | ELECTRICAL PLANT INSTALLATION STANDARD METHODS FOR SURFACE SHIPS AND SUBMARINES (EQUIPMENT) SECTION 2 OF 5 | This DoD standard (Section 2 of 5 Sections) provides guidance for Electric Plant Installation Standard Methods for Surface Ships and Submarines. Subjects addressed: equipment mounting, switchboard mounting, battery equipment,, casualty power, shore power, general installation requirement, etc. | Y | 24 June | Navy | |
| 304 | DOD | DOD-2003-3 | ELECTRICAL PLANT INSTALLATION STANDARD METHODS FOR SURFACE SHIPS | This DoD standard for Electric Plant Installation Standard Methods for Surface | Y | 24 June | Navy | |

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| Page | 8 | SWBS Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App |
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| | | | | AND SUBMARINES (PENETRATIONS) SECTION 3 OF 5. | Ships and Submarines (Section 3 of 5 Sections) provides guidance in the following areas: stuffing tubes (in great detail), kick pipes, etc. | | | |
| 304 | DOD | DOD-2003-4 | ELECTRIC PLANT INSTALLATION STANDARD METHODS FOR SURFACE SHIP AND SUBMARINES (CABLEWAYS) | This DoD standard, Electric Plant Installation Standard Methods for Surface Ships and Submarines (Cableways) (Section 4 of 5) provides in-depth guidance for cableways in military ships and submarines. It covers such subjects as: location of cable ways, vertical cable runs, deadended cables, cable slack requirement, cable bend radius, cables in submerged spaces, excessive heat, excessive moisture, installation of propulsion system cables, cable tags, cable hangers and supports, shock design, spacing, cable racks, double banking of cables, cable protection, etc. e m | Y | 24 June | Navy | |
| 304 | DOD | DOD-2003-5 | ELECTRIC PLANT INSTALLATION STANDARD METHODS FOR SURFACE SHIPS AND SUBMARINES (CONNECTORS) SECTION 5 OF 5. | This DoD standard, Electric Plant Installation Standard Methods for Surface Ships and Submarines (Connectors) (Section 5 of 5) provides in-depth guidance for cable connectors for Navy vessels. Topics discussed are: cable preparation, tinning techniques, lead stripping, connector contact soldering, shield termination procedures, cable transflexing procedure, cable bifurcation procedure, discusses different connector types assembly procedures, etc. | Y | 24 June | Navy | |
| 304 | DOD | DOD-2003-CHG | ELECTRICAL PLANT INSTALLATION | This is a change to the Dod-STD 2003 (Navy). | Y | 24 June | Navy | |

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| SWBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App | |
| | | | STANDARD METHODS FOR SURFACE SHIPS AND SUBMARINES. | | | | | |
| 304 | DOD | MIL-STD-2042-1 | FIBER OPTIC TOPOLOGY INSTALLATION, STANDARD METHODS FOR NAVAL SHIPS (CABLES) PART 1 OF 6. | This MIL-STD, Fiber Optic Topology Installation Standard Methods for Naval Ships (Cables) (Part 1 of 6) provides detailed information as to design and install fiber optic cables. Subjects Discussed: definitions, cable selection, spare optical fibers, cable stowage and handling, cable penetrations, cable installation and protection, testing, cable end sealing, cable repair, cable splicing, etc. | Y | 9 July | Navy | |
| 304 | DOD | MIL-STD-2042-4 | FIBER OPTIC TOPOLOGY INSTALLATION STANDARD METHODS FOR NAVAL SHIPS (CABLEWAYS) PART 4 OF 6 | This MIL-STD, Fiber Optic Topology Installation Standard Methods for Naval Ships (Cableways) (Part 4 of 6), provides detailed guidance for cableways for fiber optic cables. Topics discussed are: definitions, location of fiber optic cable runs, vertical cable runs, exposure to weather, excessive heat, excessive moisture, cable slack, cable bend radius, cable hangers and supports, double banking of cables, cable tags, dead-ended cables, cableways, spare cable requirement, fiber optic topology test, etc. | Y | 7 July | Navy | |
| 304 | IEC | 92 PT 352 | ELECTRICAL INSTALLATIONS IN SHIPS PART 352: CHOICE AND INSTALLATION OF CABLES FOR LOW-VOLTAGE POWER SYSTEMS FIRST EDITION; (AMEND 1-1987) (AMEND 2-1994) | This IEC standard provides guidance for choice and installation of cables for low-voltage power systems in ships. Subjects discussed: choice of insulation, cross-sectional area of conductors, current rating for continuous service, voltage drop, | Y | 4/94 | 1,2,3,4 | |

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| SWBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | | estimation of lighting loads, parallel connection of cables, short-circuit capacity, cable run installations, grounding of cable shields, radius of bends, installation in battery compartments, electrodynamic forces, tensile strength, etc. | | | | |
| 304 | IEC | IEC92-352AMD | ELECTRICAL INSTALLATIONS IN SHIPS. PART 352: CHOICE AND INSTALLATION OF CABLES FOR LOW VOLTAGE POWER SYSTEMS | Standard not available from MARAD. | Y | | | |
| 304 | IEC | IEC92-352-CEI | ELECTRICAL INSTALLATIONS IN SHIPS. PART 352: CHOICE AND INSTALLATION OF CABLES FOR LOW VOLTAGE POWER SYSTEMS. | Standard not available from MARAD. | Y | | | |
| 304 | IEEE | 422 | CABLE, ELECTRIC | Standard not available from MARAD. | Y | | | |
| 304 | JIS | F8071 | ELECTRICAL INSTALLATION IN SHIPS PART 352: CHOICE AND INSTALLATION OF CABLES FOR LOW-VOLTAGE POWER SYSTEMS. | Standard not available from MARAD. | Y | | | |
| 304 | NEMA | FG 1 | FIBERGLASS CABLE TRAY SYSTEMS | NEMA standard FG-1 provides guidance for continuous, complete fiberglass systems of ladder ventilated, solid bottom cable tray or channel type trays, intended for the support of power or control cables or both. This standard covers materials, dimensions, testing, working load capacity, effects of temperature, thermal contraction and expansion, etc for fiber glass cable tray systems. CAUTION: applicability to marine systems may be limited. | Y | 1993 | Industr | |
| 304 | NEMA | WC 51 | AMPACITIES OF CABLES IN OPEN-TOP | NEMA standard WC 51-86 discusses Ampacities | Y | 1986 | Industr | |

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|------------|--------|--|--|---------|-----------|----------|--|--|
| SWBS Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | | |
| | | CABLE TRAYS (CORRECTION JUNE 1987) , (R 1991) | of Cables in Open-top Cable Trays. Details provided: calculated depth of cables in trays, correction factor for diameters of cables, correction factors for temperatures, correction factor for number of conductors, ampacity tables for both copper and aluminum conductors, etc. CAUTION: applicability to marine systems may be limited. | | | | | |
| 304 UL | 1277 | UL STANDARD FOR SAFETY ELECTRICAL POWER AND CONTROL TRAY CABLES WITH OPTIONAL OPTICAL-FIBER MEMBERS SECOND EDITION; NOVEMBER 5, 1993, BULLETINS DATED 9/6/89, 11/12/91, 4/13/93, 6/1 | ANSI/UL 1277 1988, Standard for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members (and Revisions) establish standards for electrical power and control cables consisting of two or more current carrying copper, aluminium or copper-clad aluminium circuit conductors with or without fully insulated grounding conductors. Subjects addressed in this lengthy standard: materials and workmanship, assembly, testing, and general construction, performance and markings for these cables. CAUTION: These rules may not be directly applicable to marine vessels. | Y | 3/7/89 | Industr | | |
| 321 NEMA | BU 1 | BUSWAY | This standard covers products for distribution of electric power at 600 volts or less, consisting of enclosed sectionalized prefabricated busbars, rated at 100 amps or more and associated structures and fittings as follows: feeder busbars (indoor or outdoor); plug in busbars (indoor only; accessories required to complete the busway system. This is an excellent reference document for voltage drops, short circuit currents, etc. | Y | 1988 | 1,2,3,4 | | |

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| Page 12 | WBS Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|---------|-----------|--------|--|---|---------|-----------|----------|
| | | | | CAUTION: Some portions of this standard may not be directly applicable to marine service. | | | |
| 121 | NEMA | BU 1.1 | BUSWAY | This standard is a guide of practical information containing information for the handling, installation, operation and maintenance of busways and associated fittings rated 600 volts or less. It provides guidance in such areas as: handling, storage, installation, steps to be taken prior to energizing, energizing equipment, maintenance, etc. CAUTION: Some portions of this standard may not be directly applicable to marine service. | Y | 1991 | 1,2,3,4 |
| 321 | UL | 857 | BUSWAYS; FITTING, ELECTRICAL | This standard covers service-entrance, feeders, and branch-circuit busways and associated fittings rated at 600 volts or less and is intended for use in accordance with the NEC. CAUTION: Some portions of this standard may not be directly applicable to marine service. | Y | 28Oct'94 | 1,2,3,4 |
| 403 | CNS | F5046 | ELECTRICAL CABLE CLIPS FOR MARINE USE (JAN) 9855 | Standard not available from MARAD. | Y | | |

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|------|-------|------------|---|--|---------|-----------|----------|--|
| WBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App | |
| 02 | DNV | 4.1.5 | MACHINERY PIPING SYSTEMS | This standard is a general guide line for machinery piping systems. Items addressed: piping system redundancy and capacity, cooling systems water supply, inlets for cooling water pumps, filtering of lubricating oil, emergency lube oil to turbine, remote shutoff for lube oil tanks, flash point of fuel oil, fuel oil tank and piping design criteria, arrangement of valves, cocks and fittings, fuel oil preheaters, feedwater and condensate systems, steam systems, hydraulic systems, pneumatic systems, etc. Well written and easy to understand specifications. | YES | JUL93 | 1,2,3,4 | |
| 05 | ABS06 | 09.2.6 | VALVE AND FITTING PUMP AND PIPING, RIVERS AND IC MATERIAL FOR VALVE AND FITTING, PUMP AND PIPING, RIVERS AND IC | Standard not available from MARAD. | | | | |
| 15 | ABS06 | 09.2.4 | PIPE FITTING, PUMP AND PIPING, RIVERS AND IC, TEST HYDROSTATIC, PIPE FITTINGS, PUMP AND PIPING RIVERS AND IC | Standard not available from MARAD. | | | | |
| 15 | AFNOR | NF J41-415 | SHIPBUILDING. KINGSTON VALVES. ASSEMBLY. GENERAL DIMENSIONS. | Standard not available from MARAD. | N | 8/57 | | |
| 15 | AFNOR | NF J41-410 | SHIPBUILDING. KINGSTON VALVES. GENERAL SPECIFICATION. | Standard not available from MARAD. | N | 8/57 | | |
| 15 | AFNOR | NF J41-410 | SHIPBUILDING. KINGSTON VALVES. GENERAL SPECIFICATION. | | N | 1957-08- | | |
| 15 | AFNOR | NF J41-415 | SHIPBUILDING. KINGSTON VALVES. ASSEMBLY. GENERAL DIMENSIONS. | Standard not available from MARAD. | N | 1957-08- | | |
| 5 | ANSI | B016.34 | VALVE | This standard specifies material, | Y | 1988 | 1,2,3,4 | |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | | pressure-temperature ratings, dimensions, testing, size etc, for valves - flanged, threaded, and welding end. | | | | |
| 05 | ANSI | B016.5 | PIPE FLANGES, VALVE, FITTING, PIPE | This standard specifies material, pressure-temperature ratings, dimensions and tolerances, size, etc, for pipe flanges and flanged fittings. | Y | 1988 | 1,2,3,4 | |
| 05 | ANSI | B016.13 | PIPE FITTING | This standard was not available from MARAD. | | | | |
| 05 | ANSI | B016.14 | PIPE FITTING, METAL | This standard specifies material, pressure-temperature ratings, dimensions and tolerances, threading, etc, for ferrous pipe plugs, bushings, and locknuts with pipe threads. | Y | 1991 | 1,2,3,4 | |
| 05 | ANSI | B016.15 | PIPE FITTING, METAL | This standard specifies material, pressure-temperature ratings, fitting dimensions and tolerances, threading, etc, for cast bronze threaded fittings. | Y | 1985 | 1,2,3,4 | |
| 05 | ANSI | B016.18 | PIPE FITTING, METAL | This standard specifies material, pressure-temperature ratings, dimensions and tolerances, threading, testing, etc, for cast copper alloy solder joint pressure fittings. | Y | 1984 | 1,2,3,4 | |
| 05 | ANSI | B016.28 | PIPE FITTING, METAL | This standard specifies material, design and pressure ratings, dimensions and tolerances, testing etc, for wrought steel butt welding short radius elbows and returns. | Y | 1994 | 1,2,3,4 | |
| 05 | ANSI | B016.3 | PIPE FITTING, METAL | This standard specifies material, pressure-temperature ratings, dimensions and tolerances, threading, etc, for malleable iron threaded pipe fittings. | Y | 1992 | 1,2,3,4 | |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|---------|--|---|---------|-----------|----------|
| 05 | ANSI | B016.26 | PIPE FITTING, METAL | This standard specifies material, pressure ratings, size, threading, etc, for cast copper alloy fittings for flared copper tubes. | Y | 1988 | 1,2,3,4 |
| 05 | ANSI | B016.4 | PIPE FITTING, METAL | This standard specifies material, pressure-temperature ratings, dimensions and tolerances, threading, etc, for gray iron threaded pipe fittings. | Y | 1992 | 1,2,3,4 |
| 05 | ANSI | B016.9 | FITTING, PIPE | This standard specifies material, pressure ratings, fittings dimensions, surface contours, end preparation, testing, and tolerances, for factory-made wrought steel butt welding piping fittings. | Y | 1993 | 1,2,3,4 |
| 05 | ANSI | B016.11 | FITTING, PIPE | This standard specifies material, pressure ratings, dimensions and tolerances, testing, size etc, for forged piping fittings, socket-welding and threaded. | Y | 1991 | 1,2,3,4 |
| 05 | ANSI | B016.22 | PIPE FITTING, METAL | This standard specifies material, pressure-temperature ratings, alignment, tolerances, threading, testing, etc, for wrought copper and copper alloy solder joint pressure fittings. | Y | 1989 | 1,2,3,4 |
| 05 | ANSI | B016.24 | PIPE FITTING, METAL, PIPE FLANGE | This standard specifies material, pressure-temperature ratings, dimensions and tolerances, tests, etc, for cast copper alloy pipe flanges and flanged fittings. | Y | 1991 | 1,2,3,4 |
| 05 | ANSI | B016.25 | PIPE FITTING, METAL, PIPE WELDING, WELDING, PIPE | This standard specifies transistion contours, welding bevel design, tolerances, and inside diameter preparation, for butt welding ends. | Y | 1992 | 1,2,3,4 |
| 05 | ANSI | B016.10 | VALVE | | | | |

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| SWBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 505 | ANSI | B016.10 | VALVE | This standard is not available from MARAD. | Y | | | |
| 505 | ASME | B16.10-92 | FACE-TO-FACE AND END-TO-END DIMENSIONS OF VALVES | This standard covers face-to-face and end-to-end dimensions of straightway valves and center-to-face and center- to-end dimensions of angle valves. Its purpose is to assure installation interchangeability for valves of a given material, type, size, rating class, and end connection. Numerous materials, and types of valves are covered. | YES | 1/15/93 | 1,2,3,4 | |
| 505 | ASTM | D1598-A | PIPE, PLASTIC, PLASTIC PIPE | This test method covers the determination of the time-to-failure of both thermoplastic and reinforced thermosetting/resin pipe under constant internal pressure. It discusses failures, ballooning, rupture and seepage and weeping. | YES | 3/28/86 | 1,2,3,4 | |
| 505 | ASTM | D2122 | PIPE, FITTING, PLASTIC, PIPE, PLASTIC, PLASTIC PIPE | This test method covers the determination of diameter, wall thickness, and length dimensions of thermoplastic pipe. Included are procedures for measurement of the inside diameter of pipe intended to be joined by internal fittings, measurement of the average outside diameter for roundable pipe where out of roundness is not of primary concern, out-of-roundness measurements and measurement of the average outside diameter of non-roundable pipe, and for determining length and straightness. | YES | 9/28/90 | 1,2,3,4 | |
| 505 | ASTM | D2143 | PIPE, PLASTIC, PLASTIC PIPE | This test method covers the determination of the failure characteristics of reinforced plastic pipe when subjected to cyclic internal hydraulic pressure. It is limited | YES | 12/15/94 | 1,2,3,4 | |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|---------|-------------------------------|--|---------|-----------|----------|
| 05 | ASTM | A522 | PIPE FITTING, LOW TEMPERATURE | to pipe in which the ratio of outside diameter to wall thickness is 10:1 or more. This specification covers 8 and 9% nickel-alloy steel forged or rolled flanges, fittings, valves, and parts intended for use in welded pressure vessels for low temperature service. It provides specifics on materials, manufacturing techniques, chemical, impact and tensile requirements, heat treatment and testing. | Y | 15Mar'95 | 1,2,3,4 |
| 05 | ASTM | D1527-A | PIPE, PLASTIC, PLASTIC PIPE | This specification covers acrylonitrile-butadiene-styrene (ABS) plastic pipe produced by single extrusion or simultaneous multiple coextrusion, in schedule 40 and 80 sizes and pressure rated for water. Included are criteria for classifying ABS plastic pipe materials and ABS plastic pipe and requirements and test methods for materials, workmanship, dimensions, sustained pressure, burst pressure, and extrusion quality, including methods of manufacture. | YES | 2/15/94 | 1,2,3,4 |
| 05 | ASTM | D1599 | PIPE, PLASTIC, PLASTIC PIPE | This test method covers the determination of the hydraulic pressure that produces failure of either thermoplastic or reinforced thermosetting resin pipe, tubing, or fitting in a short time period. This standard does not purport to address all safety problems, if any, associated with its use. | YES | 3/25/88 | 1,2,3,4 |
| 05 | ASTM | D1785-E | PIPE, PLASTIC, PLASTIC PIPE | This specification covers polyvinyl chloride (PVC) pipe made in schedule 40, 80 and 120 sizes and pressure rated for water. | YES | 12/15/94 | 1,2,3,4 |

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| IBS Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----------|--------|--|---|---------|-----------|----------|
| | | | Included are criteria for classifying PVC plastic pipe materials and PVC plastic pipe, a system of nomenclature for PVC plastic pipe and requirements and test methods for materials, workmanship, dimensions, sustained pressure, burst pressure, flattening, and, extrusion quality. | | | |
| 5 ASTM | A420 | PIPE FITTING, LOW TEMPERATURE | This specification covers wrought carbon steel and alloy steel fittings of seamless and welded construction, covered by the latest revision of ANSI B16 series. It describes material requirements, manufacturing techniques, heat treatment, chemical and tensile properties and testing. | Y | 15Aug'94 | 1,2,3,4 |
| 5 ASTM | D1503 | PIPE, PLASTIC, PLASTIC PIPE | | | | |
| 5 ASTM | D2105 | PIPE, PLASTIC, PLASTIC PIPE, TUBING | This test method covers the determination of the comparative longitudinal tensile properties of fiberglass pipe when tested under defined conditions of pretreatment, temperature, and testing machine speed. Both glass-fiber-reinforced thermosetting-resin pipe (RTRP) and glass-fiber-reinforced plastic mortar pipe (RPMP) are fiberglass pipes. This test method is generally limited to pipes 6" or under. | YES | 3/20/90 | 1,2,3,4 |
| 5 ASTM | F1370 | Standard Specification for Pressure-Reducing Valves for Water Systems, Shipboard | This specification covers self-contained, globe style, pressure-reducing valves for use in water systems of shipboard installations. These valves are limited to | YES | 2/3/92 | 1,2,3,4 |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
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| | | | | discharge pressures of 200 psig and below. Items discussed: design and test pressures, materials, valve types, testing, and valve construction and coding. | | | |
| 05 | ASTM | A350 | FITTINGS, LOW TEMPERATURE, MATERIALS FOR FORGINGS, STEEL | This specification covers several grades of carbon and low-alloy steel forged or ring-rolled flanges, forged fittings and valves intended for low-temperature service and requiring notch toughness testing. It describes manufacturing techniques, chemical and mechanical properties and testing. | YES | 15Jan'95 | 1,2,3,4 |
| 05 | ASTM | D1598-E | PIPE, PLASTIC, PLASTIC PIPE | | | | |
| 05 | ASTM | D2104 | PIPE, PLASTIC, PLASTIC PIPE | This specification covers polyethylene (P E) pipe made in schedule 40 size for use with insert fittings (inside diameter controlled) and pressure-rated for water. Included are criteria for classifying PE plastic pipe materials and PE plastic pipe, and requirements and test methods for materials, workmanship, dimensions, sustained pressure, burst pressure, and environmental stress cracking. | YES | 3/15/93 | 1,2,3,4 |
| 05 | ASTM | D2152 | PIPE, PLASTIC, PLASTIC PIPE | This test method covers the determination of the adequacy of fusion of extruded rigid polyvinyl chloride (PVC) pipe and molded fittings as indicated by reaction to immersion in anhydrous acetone. | YES | 3/15/95 | 1,2,3,4 |
| 05 | ASTM | D2153 | PIPE, PLASTIC, PLASTIC PIPE | Standard not available from MARAD. | YES | | |
| 05 | ASTM | D2235-E | CEMENT, PLASTIC PIPE, PLASTIC PIPE CEMENT | This specification covers solvent cement for joining acrylemitrile-butadiene styrene (ABS) plastic pipe and fittings for pressure | YES | 7/15/93 | 1,2,3,4 |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | | and nonpressure systems. Recommendations for using solvent cement for joining ABS plastic pipe and fittings is provided. | | | | |
| 15 | ASTM | D2241 | PIPE, PLASTIC, PLASTIC PIPE | This specification covers PVC pipe made in standard thermoplastic pipe dimension ratios and pressure rated for water. Included are criteria for classifying PVC plastic pipe materials and PVC plastic pipe, a system of nomenclature for PVC plastic pipe, and requirement and test methods for materials, workmanship, dimensions, sustained pressure, burst pressure, flattening, and extrusion quality. | YES | 12/15/94 | 1,2,3,4 | |
| 15 | ASTM | F0681 | Standard Practice for Use of Branch Connections (R 1988) | This practice lists commonly used types of branch connections for carbons steel, chromium-molybdenum steel pipe and copper copper-nickel alloy tubing. Branch to run size are provided. Other types of branch connections may be used provided they comply with the requirements of Title 46 CFR Subparts 56.07-10(f). | Yes | 7/30/82 | 1,2,3,4 | |
| 15 | ASTM | D2239 | PIPE, PLASTIC, PLASTIC PIPE | This specification covers polyethylene (PE) pipe made in standard thermoplastic pipe dimension ratios and pressure rated for water. Included are criteria for classifying PE plastic pipe materials and PE plastic pipe, a system of nomenclature for PE plastic pipe and requirements and test methods for materials, workmanship, dimensions, sustained pressure, burst pressure, and environmental stress cracking. | YES | 12/15/94 | 1,2,3,4 | |
| 5 | ASTM | D2290 | PIPE, PLASTIC, PLASTIC PIPE | This test method covers the determination of | YES | 2/15/92 | 1,2,3,4 | |

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| IBS Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----------|--------------|--|---|---------|-----------|----------|
| | | | the comparative apparent tensile strength of most tubular plastic products utilizing a split disk test fixture, when tested under defined conditions of pretreatment, temperature, humidity and test machine speed. This procedure is applicable to many types of tubular ring-shaped specimens, either parallel-fiber-reinforced, extruded, or molded. | | | |
| 15 ASTM | F1173 | Standard Specification for Epoxy Resin Fiberglass Pipe and Fittings to Be Used for Marine Applications | This specification covers machine made reinforced thermosetting epoxy resin pipe and fittings nominal pipe size (NPS) 1 through 48 in. in diameter to be used in marine piping systems in which resistance to corrosion, aging, and deterioration from seawater, gas chemicals, and sea environment is required. | Yes | 2/15/95 | 1,2,3,4 |
| 5 ASTM | D2282-A | PIPE, PLASTIC, PLASTIC PIPE | This specification cover ABS pipe produced by single extrusion or simultaneous multiple extrusion, in standard thermoplastic pipe dimension ratios and pressure rated for water. Included are criteria for classifying ABS plastic pipe materials, and ABS plastic pipe, a system of nomenclature for ABS plastic pipe, and requirement and test methods for materials, workmanship, dimensions, sustained pressure, burst pressure, and extrusion quality. | YES | 3/15/94 | 1,2,3,4 |
| 5 BSI | BS 3974 | 1980 Amd 1 Pipe Supports Part 3: Large Bore, High Temperature, Marine and Other Applications | Standard not available from MARAD. | Yes | | |
| 5 BSI | BS 3974:Part | Specification for pipe supports. | This standard (Part 3) specifies material, | Y | 1980-10- | 1,2,3,4 |

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| <u>IBS Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------------|---------------|--|---|----------------|------------------|-----------------|
| | | Large bore, high temperature, marine and other applications | design requirements, and dimensions for the manufacture of pipe supports components for larger size pipes (see Part 1 and 2 for smaller pipes). The supports listed are: (1) Carbon steel pipe clips, overstraps, and U-bolts; (2) Alloy steel pipe clips, U-straps and riser straps; (3) Copper alloy overstraps and hookstraps. | | | |
| 15 Bundesam | VG85570Teil 2 | Pipe clamps with elastomer insert for heavy duty; structural rubber | This standard is not available from MARAD. | N | 1991-02- | |
| 15 Bundesam | VG85060Teil 1 | Flanged slide valves made of G-CuSn 10; DN 40 to 80, PN 40; assembly | Standard not available from MARAD. | N | 1990-02- | |
| 15 Bundesam | VG85570Teil 1 | Pipe clamps with elastomer insert for heavy duty, for pipes with outer diameter of 20 to 324 mm | This standard is not available from MARAD. | N | 1991-02- | |
| 15 Bundesam | VG85033Teil 4 | Flanged valves made of G-CuSn 10; straight way valves; shut off and non return valves with plastic-caulking; DN 40 to 150, PN 10, DN 175 to 300, PN 6 (not for new design) | Standard not available from MARAD. | N | 1990-09- | |
| 15 Bundesam | VG85034Teil 2 | Flanged valves made of G-CuSn 10; angle valves; shut off and non return valves; DN 40 to 150, PN 10, DN 175 to 300, PN 6 | Standard not available from MARAD. | N | 1990-09- | |
| 15 Bundesam | VG85036Teil 1 | Flanged valves made of G-CuSn 10; angle valve bodies, DN 20, 25 and 32, PN 25 | Standard not available from MARAD. | N | 1990-02- | |
| 15 Bundesam | VG 85380 | Hydraulic valves; technical specification | Standard not available from MARAD. | N | 1979-05- | |

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| WBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App. |
|-----|----------|---------------|--|--|---------|-----------|-----------|
| 505 | Bundesam | VG 85523 | Hull valves; technical specification | Standard not available from MARAD. | N | 1986-12- | |
| 505 | Bundesam | VG 85053 | Butterfly valves made of G-CuSn10 wafer type, DN 50 to 150 - PN 10, DN 175 to 300 - PN 6; assembly | Standard not available from MARAD. | N | 1990-04- | |
| 505 | Bundesam | VG 85033 Teil | Flanged valves made of G-CuSn 10; straight way valves; shut off and non return valves with plastic-caulking; DN 40 to 150, PN 10, DN 175 to 300, PN 6 (not for new design) | This standard is not available from MARAD. | N | 1990-09- | |
| 505 | Bundesam | VG 85034 Teil | Flanged valves made of G-CuSn 10; angle valves; shut off and non return valves; DN 40 to 150, PN 10, DN 175 to 300, PN 6 | This standard is not available from MARAD. | N | 1990-09- | |
| 505 | Bundesam | VG 85036 Teil | Flanged valves made of G-CuSn 10; angle valve bodies, DN 20, 25 and 32, PN 25 | This standard is not available from MARAD. | N | 1990-02- | |
| 505 | Bundesam | VG 85053 | Butterfly valves made of G-CuSn10 wafer type, DN 50 to 150 - PN 10, DN 175 to 300 - PN 6; assembly | This standard is not available from MARAD. | N | 1990-04- | |
| 505 | Bundesam | VG 85060 Teil | Flanged slide valves made of G-CuSn 10; DN 40 to 80, PN 40; assembly | This standard is not available from MARAD. | N | 1990-02- | |
| 505 | Bundesam | VG 85380 | Hydraulic valves; technical specification | This standard is not available from MARAD. | N | 1979-05- | |
| 505 | Bundesam | VG 85523 | Hull valves; technical specification | This standard is not available from MARAD. | N | 1986-12- | |
| 505 | CNS | F3160 | Marine Bronze 16 kgf/cm2 Angle Valves (Union Bonnet Type) (Jan) (8275) | Standard not available from MARAD. | | | |
| 505 | CNS | F3166 | Marine Bronze 5 kgf/cm2 Lift Check | Standard not available from MARAD. | | | |

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PIPING

| age | 12 | | | | | | | |
|-----|-------|---------|--|--|---------|-----------|----------|--|
| WBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App | |
| | | | Valves (Feb) (8496) | | | | | |
| 05 | CNS | F3112 | Marine Cast Steel Globe Valves (20 kgf/cm2) (Dec) (7684) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3178 | Marine Bronze 5 kgf/cm2 Rising Stem Type Gate Valves (May) (8819) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3007 | Cast Iron Gate Valves for Marine Use (10kgf/cm2) (Mar) (3812) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3133 | Marine Malleable Iron Globe Valves (5 kgf/cm2) (Dec) (7900) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3144 | Marine Bronze Hose Valves (Nov) (8108) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3181 | Marine Bronze 5 kgf/cm2 Swing Check Valves (May) (8822) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3008 | Cast Iron Screw-Down Check Angle Valves for Marine Use (10kgf/cm2) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3009 | Cast Steel Vertical Storm Valve for Marine Use (Mar) (3814) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3191 | Marine Bronze 20 kgf/cm2 Angle Valves (Aug) (9253) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3006 | Cast Iron Gate Valves for Marine Use (5kgf/cm2) (Mar) (3811) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3100 | Marine Cast Iron Globe Valve (Dec) (7243) | Standard not available from MARAD. | | | | |
| 05 | CNS | F3006 | Cast Iron Gate Valves for Marine Use (5kgf/cm2) (Mar) (3811) | This standard is not available from MARAD. | | | | |
| 05 | CNS | F3007 | Cast Iron Gate Valves for Marine Use (10kgf/cm2) (Mar) (3812) | This standard is not available from MARAD. | | | | |
| 05 | CNS | F3008 | Cast Iron Screw-Down Check Angle | This standard is not available from MARAD. | | | | |

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| Page | 13 | | | | | | | |
|------|-------|-----------|--|--|---------|-----------|----------|--|
| SWBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App | |
| | | | Valves for Marine Use (10kgf/cm2) | | | | | |
| 505 | CNS | F3009 | Cast Steel Vertical Storm Valve for Marine Use (Mar) (3814) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3100 | Marine Cast Iron Globe Valve (Dec) (7243) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3112 | Marine Cast Steel Globe Valves (20 kgf/cm2) (Dec) (7684) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3133 | Marine Malleable Iron Globe Valves (5 kgf/cm2) (Dec) (7900) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3144 | Marine Bronze Hose Valves (Nov) (8108) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3160 | Marine Bronze 16 kgf/cm2 Angle Valves (Union Bonnet Type) (Jan) (8275) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3166 | Marine Bronze 5 kgf/cm2 Lift Check Valves (Feb) (8496) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3178 | Marine Bronze 5 kgf/cm2 Rising Stem Type Gate Valves (May) (8819) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3181 | Marine Bronze 5 kgf/cm2 Swing Check Valves (May) (8822) | This standard is not available from MARAD. | | | | |
| 505 | CNS | F3191 | Marine Bronze 20 kgf/cm2 Angle Valves (Aug) (9253) | This standard is not available from MARAD. | | | | |
| 505 | DIN | DIN 86016 | Pipe brackets of steel for ships pipelines of unplasticized polyvinyl chloride (PVC-U) | This standard is not available from MARAD. | N | 1991-03- | | |
| 505 | DIN | DIN 86063 | Connecting sockets with pipe flange, for steel tubes, nominal pressure 16 | This standard is not available from MARAD. | N | 1976-07- | | |
| 505 | DIN | DIN 86064 | Connecting sockets with pipe flange | This standard is not available from MARAD. | N | 1976-07- | | |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|-----------|---|--|---------|-----------|----------|
| | | | and fixing collar, for steel tubes, nominal pressure 10 | | | | |
| 05 | DIN | DIN 86100 | Tube fittings and screw plugs; summary of types for shipbuilding | This standard is not available from MARAD. | Y | 1973-11- | |
| 05 | DIN | DIN 86061 | Connecting sockets with pipe flange, for steel tubes, nominal pressure 10 | This standard is not available from MARAD. | N | 1976-07- | |
| 05 | DIN | DIN 86065 | Connecting sockets with pipe flange and fixing collar, for steel tubes, nominal pressure 16 | This standard is not available from MARAD. | N | 1976-07- | |
| 05 | DIN | DIN 86088 | Fittings for butt welding into wrought copper alloy pipe lines; tees | This standard is not available from MARAD. | N | 1984-10- | |
| 05 | DIN | DIN 86014 | Bulkhead fittings for pipes of unplasticized polyvinyl chloride (PVC-U) | This standard is not available from MARAD. | N | 1989-05- | |
| 05 | DIN | DIN 86089 | Fittings for butt welding into wrought copper alloy pipe lines; concentric reducers | This standard is not available from MARAD. | N | 1984-10- | |
| 05 | DIN | DIN 86090 | Fittings for butt welding into wrought copper alloy pipe lines; bends | This standard is not available from MARAD. | N | 1984-10- | |
| 05 | DIN | DIN 86013 | Pipes of unplasticized polyvinyl chloride (PVC-U) for pipelines on ships | Standard not available from MARAD. | N | 1989-05- | |
| 05 | DIN | DIN 86087 | Fittings for butt welding into wrought copper alloy pipe lines; saddle type connections | This standard is not available from MARAD. | Y | 1984-10- | |
| 05 | DIN | DIN 86500 | Valves and Gate Valves with Screwed Connections; Survey of Types for | This standard contains a survey of the types, shapes, and sizes of standard valves | Y | 1968-08- | 1,2,3,4 |

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age 15

| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|-----------|--|--|---------|-----------|----------|
| | | | Shipbuilding | and gate valves with screwed connections, selected and to be used preference for the piping systems installed on ships. The use of other fittings of this class should be avoided as far as possible for reasons of deliberate restriction of the number of types used. The type, shapes, and sizes laid down in this survey are intended to contribute to simplifying the storage and procurement of spare parts. | | | |
| 05 | DIN | DIN 86012 | Pipelines of unplasticized polyvinyl chloride (PVC-U) on ships, with cold-welded joints; requirements, dimensions for bonding, summary of components | Standard not available from MARAD. | Y | 1984-01- | |
| 05 | DIN | DIN 86012 | Pipelines of unplasticized polyvinyl chloride (PVC-U) on ships, with cold-welded joints; requirements, dimensions for bonding, summary of components | This standard is not available from MARAD. | Y | 1984-01- | |
| 05 | DIN | DIN 86013 | Pipes of unplasticized polyvinyl chloride (PVC-U) for pipelines on ships | This standard is not available from MARAD. | N | 1989-05- | |
| 05 | DIN | DIN 86500 | Valves and Gate Valves with Screwed Connections; Survey of Types for Shipbuilding | This standard is not available from MARAD. | Y | 1968-08- | |
| 05 | DNV | 05.04.06 | Chemical Carriers; Piping Systems in Cargo Area | Standard not available from MARAD. | | | 4 |
| 05 | DNV | 05.04.08 | Chemical Carriers; Marking of Tanks, Pipes and Valves | Standard not available from MARAD. | | | 4 |
| 05 | DNV | 05.05.06 | Liquefied Gas Carriers; Piping | Standard not available from MARAD. | | | 2 |

PIPING

age 16

| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|----------|--|--|---------|-----------|----------|
| | | | Systems in Cargo Area | | | | |
| 05 | DNV | 05.05.08 | Liquefied Gas Carriers; Marking of Tanks, Pipes and Valves | Standard not available from MARAD. | | | 2 |
| 05 | DNV | 05.03.04 | Oil Carriers; Piping Systems in Cargo Area | Standard not available from MARAD. | | | 4 |
| 05 | DNV | 05.03.04 | Oil Carriers; Piping Systems in Cargo Area | This standard discusses the requirement for piping systems in cargo areas of oil carriers. The following general areas are discussed: bilge, ballast and fuel oil systems, including drainage, oil discharge, and sounding; cargo piping systems for barges, and cargo heating. | YES | JUL93 | 4 |
| 05 | DNV | 05.04.06 | Chemical Carriers; Piping Systems in Cargo Area | These DNV rules apply to chemical carrier cargo area piping systems. The following general areas are discussed: pumping and piping systems for bilge, ballast, and fuel oil; chemical cargo piping systems including design and arrangement; stripping of cargo tank and cargo lines. | YES | JUL93 | 4 |
| 05 | DNV | 05.04.08 | Chemical Carriers; Marking of Tanks, Pipes and Valves | This DNV standard provides guidance for marking of tanks, pipes, and valves for chemical carriers. | YES | JUL93 | 4 |
| 05 | DNV | 05.05.06 | Liquefied Gas Carriers; Piping Systems in Cargo Area | This DNV standard discusses the requirements for LNG cargo area piping systems. Items discussed: pumping and piping systems for bilge, ballast, and fuel oil; cargo piping systems including arrangement and design; cargo hoses, bow and stern loading and unloading arrangements, and vapour return connections. | YES | JUL93 | 2 |
| 05 | DNV | 05.05.08 | Liquefied Gas Carriers; Marking of | This DNV standard discusses the requirement | YES | JUL93 | 2 |

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Age 17

| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|--------------|--|--|---------|-----------|----------|
| | | | Tanks, Pipes and Valves | for marking of tanks, pipes and valves for LNG carriers. | | | |
| 05 | DOD | MIL-F-20670B | FLANGE, PIPE, CARBON STEEL 150 P.S.I., W.S.P. (FOR NAVAL SHIPYARD USE) REFRIGERATORS; FROZEN FOOD CABINETS; AND COMBINATION REFRIGERATOR-FROZEN FOOD CABINETS, MECHANICALLY REFRIGER | This specification covers carbon steel pipe flanges, 150 PSI W.S.P. Specifications included: material, dimensions, chemical composition, physical properties, tolerances, testing, etc. | Y | 26Mar'91 | Naval |
| 05 | DOD | MIL-F-20670B | FLANGE, PIPE, CARBON STEEL 150 P.S.I., W.S.P. (FOR NAVAL SHIPYARD USE) | This is a Notice for MIL-F-20670B | Y | | NAVAL |
| 05 | DOD | MIL-F-21467D | FITTINGS, FLARELESS, FLUID CONNECTION (SHIPBOARD USE) (USE MIL-F-18866) | This standard has been cancelled. | | | |
| 05 | DOD | MIL-P-24608A | PIPE, FITTINGS, AND ADHESIVE KITS, GLASS-REINFORCED THERMOSETTING EPOXY RESIN FOR SHIPBOARD PIPING SYSTEMS | This specification covers glass-reinforced thermosetting epoxy resin pipe, glass-reinforced thermosetting epoxy resin fittings, and thermosetting epoxy resin joint adhesive kits for shipboard piping systems. It covers materials, construction techniques, glass composition, dimensions, tolerances, threading, physical properties, testing, etc. | Y | 12Nov'81 | Naval |
| 05 | DOD | MIL-V-1189D | VALVE, GATE, BRONZE | This specification describes gate valves for use in water, oil, gas and steam services on board ship. It discusses materials, service ratings, construction, design parameters, etc. | YES | 8/25/58 | NAVAL |
| 05 | DOD | MIL-P-15877D | PIPE SUPPORT DEVICES (HANGERS AND SWAYBRACES, SHIPBOARD USE) | This specification covers constant support, variable support pipe hangers, and swaybraces for shipboard piping. It also | Y | 29 June | Naval |

PIPING

age 18

| WBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|--------------|---|--|---------|-----------|----------|
| | | | | provides for material, spring, rod, construction and testing requirements for Type I, hangers: coil and Belville spring; Type 2, variable support (coil) hangers and Type III, coil, spring and hydraulic swaybraces. | | | |
| 05 | DOD | QPL-15877-21 | HANGERS, PIPE #SPRING HANGERS AND SWAYBRACES, SHIPBOARD USE# | This standard has been cancelled. | | | |
| 05 | DOD | MIL-V-1189D | VALVE, GATE, BRONZE | This standard is not available from MARAD. | YES | | NAVAL |
| 05 | JIS | F 3025 | Remote Handling Fittings for Valves on Small Ships' Forepeak Bulkhead | This standard provides for material, construction, dimensions, testing, etc. for fittings for manual remote control gears for forepeak bulkhead valve mainly of nominal diameter 100mm or under. It includes: deck stand, yoke, fork, bracing, and check ring. | Y | 1975 | 1,2,3,4 |
| 05 | JIS | F 7321 | Marine Malleable Iron 5 kgf/cm2 Globe Valves | Standard not available from MARAD. | | | |
| 05 | JIS | F 7302 | Marine Bronze 5 kgf/cm2 Angle Valves | Standard not available from MARAD. | | | |
| 05 | JIS | F 7301 | Marine Bronze 5 kgf/cm2 Globe Valves | Standard not available from MARAD. | | | |
| 05 | JIS | F 7314 | Marine Cast Steel 20 kgf/cm2 Angle Valves | Standard not available from MARAD. | | | |
| 05 | JIS | F 7335 | Marine Hose Connections and Fittings | Standard not available from MARAD. | | | |
| 05 | JIS | F 7371 | Marine Bronze 5 kgf/cm2 Swing Check Valves | Standard not available from MARAD. | | | |
| 05 | JIS | F 7366 | Marine Cast Steel 10 kgf/cm2 Gate Valves | Standard not available from MARAD. | | | |
| 05 | JIS | F 7346 | Marine Bronze 5 kgf/cm2 Globe Valves (Union Bonnet Type) | Standard not available from MARAD. | | | |

PIPING

| age | 19 | | | | | | | |
|-----|-------|--------|--|---|---------|-----------|----------|--|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 05 | JIS | F 7301 | Marine Bronze 5 kgf/cm2 Globe Valves | This standard is not available from MARAD. | | | | |
| 05 | JIS | F 7302 | Marine Bronze 5 kgf/cm2 Angle Valves | This standard is not available from MARAD. | | | | |
| 05 | JIS | F 7314 | Marine Cast Steel 20 kgf/cm2 Angle Valves | This standard is not available from MARAD. | | | | |
| 05 | JIS | F 7321 | Marine Malleable Iron 5 kgf/cm2 Globe Valves | This standard is not available from MARAD. | | | | |
| 05 | JIS | F 7346 | Marine Bronze 5 kgf/cm2 Globe Valves (Union Bonnet Type) | This standard is not available from MARAD. | | | | |
| 05 | JIS | F 7366 | Marine Cast Steel 10 kgf/cm2 Gate Valves | This standard is not available from MARAD. | | | | |
| 05 | JIS | F 7371 | Marine Bronze 5 kgf/cm2 Swing Check Valves | This standard is not available from MARAD. | | | | |
| 05 | MASS | 74.02 | PIPING SYSTEMS, DESIGN | This MARAD specification provides general system design guidance for machinery pressure piping systems, | YES | NOV95 | 1,2,3,4 | |
| 05 | MASS | 74.03 | PIPING INSTALLATION | This MARAD specification provides guidance for installation of machinery pressure piping systems. | YES | NOV95 | 1,2,3,4 | |
| 05 | MASS | 74.01 | PIPING SYSTEMS, GENERAL REQUIREMENTS | This MARAD specification provides general guidance for machinery pressure piping systems. | YES | NOV95 | 1,2,3,4 | |
| 05 | MASS | 74.01 | PIPING SYSTEMS, GENERAL REQUIREMENTS | This standard is not available from MARAD. | | | | |
| 05 | MASS | 74.02 | PIPING SYSTEMS, DESIGN | This standard is not available from MARAD. | | | | |
| 05 | MASS | 74.03 | PIPING INSTALLATION | This standard is not available from MARAD. | | | | |
| 05 | MASSD | 74.03 | PIPING INSTALLATION | This MARAD specification provides general installation guidance for machinery pressure piping systems. | YES | NOV95 | 1,2,3,4 | |
| 05 | MASSD | 74.03 | PIPING INSTALLATION | This standard is not available from MARAD. | | | | |

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| <u>NBS</u> | <u>Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|---------------|--|---|----------------|------------------|-----------------|
| 15 | MOD UK | NES 360 | List of Preferred Standard Valves (Metric) Issue 3 (11.91); Amendment 3 | This standard is not available from MARAD. | YES | | |
| 15 | MOD UK | NES 360 | List of Preferred Standard Valves (Metric) Issue 3 (11.91); Amendment 1 | This standard is not available from MARAD. | YES | | |
| 15 | MOD UK | NES 360 | List of Preferred Standard Valves (Metric) Issue 3 (11.91); Amendment 2 | This standard is not available from MARAD. | YES | | |
| 15 | MOD UK | NES 360 | List of Preferred Standard Valves (Metric) Issue 3 (11.91); Amendment 1 | This standard is not available from MARAD. | | | |
| 15 | MOD UK | NES 360 | List of Preferred Standard Valves (Metric) Issue 3 (11.91); Amendment 2 | This standard is not available from MARAD. | | | |
| 15 | MOD UK | NES 360 | List of Preferred Standard Valves (Metric) Issue 3 (11.91); Amendment 3 | This standard is not available from MARAD. | | | |
| 15 | MSS | SP-51 | Class 150LW Corrosion Resistant Cast Flanges and Flanged Fittings | This standard is not available from MARAD. | | | |
| 15 | MSS | SP-77 | Guidelines for Pipe Support Contractual Relationships Relationships and Responsibilities of the Pipe Hanger Contractor with the Purchaser's Engineer or the Pipe Fabricator and/or | This MSS (Manufacturers Standardization Society) standard establishes practical and recognizable guidelines relative to defining areas of responsibility for pipe hanger contractors, purchaser's engineers, and pipe fabrication and/ or erectors. Pipe hanger design, fabrication, coating, etc is addressed. CAUTION: some portions of this standard may not be applicable to all marine applications. | YES | 1995 | 1,2,3,4 |

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| age | 21 | | | | | | | |
|-----|-------|----------|---|---|---------|-----------|----------|--|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 05 | MSS | SP-58 | Pipe Hangers and Supports - Materials, Design and Manufacture | This standard is not available from MARAD. | | | | |
| 05 | MSS | SP-69 | Pipe Hangers and Supports - Selection and Application | This standard is not available from MARAD. | | | | |
| 05 | MSS | SP-44 | Steel Pipe Line Flanges | This standard is not available from MARAD. | | | | |
| 05 | MSS | SP-89 | Pipe Hangers and Supports - Fabrication and Installation Practices | This MSS (Manufacturers Standardization Society) standard establishes recommended procedures for the detailing, fabrication, and installation of pipe hangers and supports. Items discussed: dimensional tolerances, fabrication, materials, testing, etc. CAUTION: Some portions of this standard may not be applicable to marine practices. | YES | 1991 | 1,2,3,4 | |
| 05 | MSS | SP-77 | Guidelines for Pipe Support Contractual Relationships Relationships and Responsibilities of the Pipe Hanger Contractor with the Purchaser's Engineer or the Pipe Fabricator and/or | This standard is not available from MARAD. | | | | |
| 05 | MSS | SP-89 | Pipe Hangers and Supports - Fabrication and Installation Practices | This standard is not available from MARAD. | | | | |
| 05 | NFPA | FCLCH 30 | Piping, Valves, and Fittings (Flammable and Combustible Liquids Code Handbook, 3rd ed., 1987) | This standard provides requirements for storage, handling and use of flammable liquids. It includes tank storage requirements, container and portable storage requirements, operations, etc. | Yes | 1993 | n/a | |
| 05 | SAA | AS 2117 | Hose and Hose Assemblies for Petroleum Products - Marine Suction and Discharge | This standard is not available from MARAD. | Yes | | | |

PIPING

age 22

| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|--------|---------------|--|---|---------|-----------|----------|
| 05 | UL | 203 | UL Standard for Safety Pipe Hanger Equipment for Fire Protection Service Seventh Edition; August 6, 1992 | These requirement cover the performance of pipe hanger equipment for use in supporting piping employed in sprinkler systems, water-spray systems, and other piping systems used for fire protection. Items discussed: materials, hanger rod sizes, construction, coatings, etc. CAUTION: all requirement may not be applicable to some marine applications. | YES | 8/6/92 | 1,2,3,4 |
| 05 | UL | 203 | UL Standard for Safety Pipe Hanger Equipment for Fire Protection Service Seventh Edition; August 6, 1992 | This standard is not available from MARAD. | | | |
| 05 | USCG | 46C56.15 | PIPE FITTING, TEST, HYDROSTATIC FOR PIPE JOINT FITTINGS, TEST, COLD FLATTENING FOR PIPE JOINT FITTINGS | This standard specifies that threaded, flanged, socket-welding, butt welding, and socket brazing pipe joining fittings (made IAW Tables 56.60) may be used in piping systems within the material, size, pressure and temperature limitations specified by this section. Fittings must be designed for the maximum pressure to which they will be subjected, but in no case less than 50 PSIG. | Y | 20Oct'89 | 1,2,3,4 |
| 08 | MOD UK | NES801PART 3 | Requirements for Insulation Material Part 3: Glass Fibre Products Glass Webbing for Pipe Hangers Issue 2 (04.89) | This standard is not available from MARAD. | YES | | |
| 08 | MOD UK | NES 801: PART | Requirements for Insulation Material Part 3: Glass Fibre Products Glass Webbing for Pipe Hangers Issue 2 (04.89) | This standard is not available from MARAD. | | | |
| 21 | | 10.4.4 | FIRE EXTINGUISHING SYSTEM, STEEL | This standard is not available from MARAD. | YES | | |

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| <u>SWBS</u> | <u>Organ</u> | <u>Std-No.</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App.</u> |
|-------------|--------------|----------------|---|---|----------------|------------------|------------------|
| | | | FLOATING DRY DOCKS | | | | |
| 21 | ABS06 | 12.3 | FIRE EXTINGUISHING SYSTEM, RIVERS AND IC; HOSE, FIRE, REQUIREMENTS FOR STEEL VESSELS ON RIVERS AND IC | This standard is not available from MARAD. | YES | | |
| 21 | ISO | 3926 | Shipbuilding - Inland Navigation - Fire- Fighting Water System - Pressures First Edition | This international standard was developed with the aim of unifying the mating dimensions of filling devices on board ships for lubricating oil and liquid fuels. This standard specifies three size couplings, nominal pipe sizes, and mating dimensions. | Yes | 1Aug'80 | 1,2,3,4 |
| 21 | MASS | 58.06 | FIRE MAIN SYSTEM | This standard states that a complete fire main system shall be provided in accordance with the requirements of the Regulatory Bodies. Each pump shall discharge through a separate riser to the fire main. It also describes how fire mains and risers shall be located to reduce damage due to collisions. | Y | Draft'95 | 1,2,3,4 |
| 21 | MASDD | 58.04 | FIRE MAIN SYSTEM | This standard specifies that the fire and foam pump shall be located in the shaft alley. The main fire pump shall be located in the engine room. All fire main and fire stations exposed to freezing shall be on branches of the fire main with shut -off valves, etc. | Y | Draft'95 | 1,2,3,4 |
| 21 | SOLAS | 11-2-A-SH | SHORE CONNECTION, INTERNATIONAL; FIREHOSE CONNECTION | This standard, printed from Lloyd's Register's Rulefinder, cover SOLAS specifications for fire pumps, fire mains, hydrants, hoses, and international shore connections. It specifies: pump capacities, diameter and pressure of fire mains, number and position of hydrants, fire | Y | 1974 | 1,2,3,4 |

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| SWBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 521 | USCG | 46C76.10 | FIRE PROTECTION EQUIPMENT-FIRE MAIN SYSTEM, DETAILS | hose and nozzle requirements, location and arrangement of fire pumps, etc. This standard specifies that: on all vessels on an international voyage, regardless of the date of construction, water pressure from the firemain protecting enclosed spaces shall be immediately available by maintenance of water pressure on the firemain at all times when passengers are aboard the vessel, or by remote control of fire pumps which control shall be easily operable and rapidly accessible. | Y | 20Dec'67 | 1,2,3,4 | |
| 528 | ANSI | B016.12 | DRAIN FITTING | This standard specifies material, dimensions and tolerances, threading, coatings, etc, for cast iron threaded drainage fittings. | Y | 1991 | 1,2,3,4 | |
| 528 | ANSI | B016.23 | DRAIN FITTING | This standard specifies material, size, inspection tolerances, pitch, threading, etc, for cast copper alloy solder joint drainage fittings - DWV. | Y | 1992 | 1,2,3,4 | |

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| SWBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 610 | Bundesam | VG 85194 | Jack-staff | Standard not available from MARAD. | N | 1969-05 | | |
| 610 | Bundesam | VG 85195 | Jack-staff socket | Standard not available from MARAD. | N | 1969-05 | | |
| 611 | ABS04 | 10.23 | FITTINGS, DECK, STEEL BARGE OFFSHORE; CLEAT, STEEL BARGE OFFSHORE; CHOCK, STEEL BARGE OFFSHORE | Standard not available from MARAD. | Y | | | |
| 611 | ABS06 | 4.6 | DECK FITTING, BARGE ON RIVERS AND IC; BITT, CHOCK AND CLEAT, BARGE ON RIVERS AND IC | Standard not available from MARAD. | Y | | | |
| 611 | MASS | 5.06 | PADEYE | Standard not available from MARAD. | Y | | | |
| 611 | MASS | 5.09 | MOORING FENDER; FENDER, MOORING | Standard not available from MARAD. | Y | | | |
| 611 | MASS | 5.10 | DOCKING FENDER; FENDER, DOCKING | Standard not available from MARAD. | Y | | | |
| 611 | MASS | 8.05 | JACKSTAFF | Standard not available from MARAD. | Y | | | |
| 611 | MASS | 8.06 | DAVIT | Standard not available from MARAD. | Y | | | |
| 611 | ABS | 20.1.1 | GUARD RAIL | This standard specifies the height of bulwarks and guard rails on exposed parts of freeboard and superstructure decks. It also specifies the spacing of guard rails. Where specified height would interfere with the normal operation of the vessel, a lesser height may be approved if adequate protection is provided. | Y | | 1,2,3,4 | |
| 612 | AFNOR | NF J83-211 | INLAND NAVIGATION. GUARDRAILS FOR DECKS. | Standard not available from MARAD. | N | 1966-07 | | |
| 612 | ASTM | F1092 | Standard Specification for Fiberglass (GRP) Pultruded Open-Weather Storm- and Guard-Square Handrails | This specification provides the material requirements, construction, insulation, and testing requirements for open-weather deck, storm-and-guard, fiberglass square rails. All required safety requirements may not be | Yes | 30Oct'87 | 1,2,3,4 | |

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| SWBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 612 | BSI | BS MA 40-1 | 1975 Amd 0 Marine Guardrails, Stanchions, Etc Part 1: Guardrails for Merchant Ships (Excluding Passenger Ships) | addressed. This standard specifies dimensions, material, quality of manufacture and finish for guardrails and stanchions which are fitted on exposed freeboard and superstructure decks of merchant ships to prevent personnel falling overboard or to lower decks and for handrails at ladder positions. | Yes | Mar'75 | 1,2,3,4 | |
| 612 | BSI | BS MA 40-2 | 1975 Amd 0 Marine Guardrails, Stanchions, Etc Part 2: Gates and Portable Guardrail Sections for Merchant Ships (Excluding Passenger Ships) | This part of this standard specifies dimensions, materials, quality of manufacture and finish for gates and portable guardrail sections which are fitted in the line of guardrails to provide access to lifeboats and accommodation ladders as well as permitting gangways to be laid from the dockside onto the deck. | Yes | Apr'75 | 1,2,3,4 | |
| 612 | BSI | BS MA 40-3 | 1975 Amd 0 Marine Guardrails, Stanchions, Etc Part 3: Stormrails (Exterior) | This part of this standard specifies dimensions, quality of manufacture and finish for storm rails for exterior locations. Interior storm rails, while not covered by this standard, shall conform to the height above deck and hand clearance dimensions. | Yes | Apr'75 | 1,2,3,4 | |
| 612 | BSI | BS MA 40:Part | Specification for marine guardrails, stanchions, etc. Guardrails for merchant ships (excluding passenger ships) | Standard not available from MARAD. | Y | 4/30/75 | | |
| 612 | BSI | BS MA 40:Part | Specification for marine guardrails, stanchions, etc. Gates and portable guardrail sections for merchant | Standard not available from MARAD. | Y | 4/30/75 | | |

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| SWBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | ships (excluding passenger ships) | | | | | |
| 512 | BSI | BS MA 40:Part | Specification for marine guardrails, stanchions, etc. Storm rails (exterior) | Standard not available from MARAD. | Y | 4/30/75 | | |
| 612 | BSI | BS MA 52 | 1974 Amd 0 Ships' Deck Machinery; Accommodation Ladder Winches | This standard specifies requirements for the design, construction, safety, performance and acceptance testing of ship's accommodation ladder winches. This standard does not include requirements for the prime mover used to operate the wench. | Yes | May'94 | 1,2,3,4 | |
| 612 | Bundesam | VG 85209 | Guard rails | Standard not available from MARAD. | N | 3/82 | | |
| 612 | Bundesam | VG 85210 | Railings for ships; directions for construction and synopsis for railings | Standard not available from MARAD. | N | 1/83 | | |
| 612 | Bundesam | VG 85211 Teil | Railings for ships; ropes for railings; assembly | Standard not available from MARAD. | N | 1/83 | | |
| 612 | Bundesam | VG 85211 Teil | Railings for ships; ropes for railings; component parts | Standard not available from MARAD. | N | 1/83 | | |
| 612 | Bundesam | VG 85212 | Railings for ships; tubes for rail stanchions | Standard not available from MARAD. | N | 1/83 | | |
| 612 | Bundesam | VG 85213 | Railing for ships; heels for rail stanchions | Standard not available from MARAD. | N | 1/83 | | |
| 612 | Bundesam | VG 85214 | Railings for ships; base plates for rail stanchions | Standard not available from MARAD. | N | 1/83 | | |
| 612 | Bundesam | VG 85215 | Railings for ships; heel plates for rail stanchions | Standard not available from MARAD. | N | 1/83 | | |
| 612 | Bundesam | VG 85216 Teil | Railings for ships; joints for rail stanchions; assembly | Standard not available from MARAD. | N | 1/83 | | |

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|-----|----------|---------------|---|------------------------------------|---------|-----------|----------|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
| 12 | Bundesam | VG 85216 Teil | Railings for ships; joints for rail stanchions; component parts | Standard not available from MARAD. | N | 1/83 | |
| 12 | Bundesam | VG 85217 | Railings for ships; rope clamps and rope ears for rail stanchions | Standard not available from MARAD. | N | 1/83 | |
| 12 | Bundesam | VG 85226 | Railings for ships; gural rails for railing openings | Standard not available from MARAD. | N | 7/82 | |
| 12 | Bundesam | VG 85241 Teil | Railings for ships; stays for rail stanchions; assembly | Standard not available from MARAD. | N | 7/83 | |
| 12 | Bundesam | VG 85241 Teil | Railings for ships; stays for rail stanchions; component parts | Standard not available from MARAD. | N | 7/83 | |
| 12 | Bundesam | VG 85243 | | Standard not available from MARAD. | N | 7/82 | |
| 12 | Bundesam | VG 85245 Teil | Detachable railings for ship to shore and ship to ship gangways; rail stanchion | Standard not available from MARAD. | N | 6/90 | |
| 12 | Bundesam | VG 85245 Teil | Detachable railings for ship to shore and ship to ship gangways; holder for rail stanchion and detachable rail sections | Standard not available from MARAD. | N | 6/90 | |
| 12 | Bundesam | VG 85245 Teil | Detachable railings for ship to shore and ship to ship gangways; detachable rail sections | Standard not available from MARAD. | N | 3/91 | |
| 12 | DIN | DIN 81701 | Inland navigation; detachable deck-rails; stanchion, holder for stanchion | Standard not available from MARAD. | N | 9/88 | |
| 12 | DIN | DIN 81702 | Steel guard rails on deck for sea going ships | Standard not available from MARAD. | N | 9/91 | |
| 12 | DIN | DIN 81703 | Gates in fixed guard rails on the deck of sea-going vessels | Standard not available from MARAD. | N | 4/91 | |

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| <u>WBS</u> | <u>Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|---------------|--|--|----------------|------------------|-----------------|
| 12 | DIN | DIN 81704 | Handrails at superstructures and deckhouses on ships | Standard not available from MARAD. | N | 1/82 | |
| 12 | DIN | DIN 81705 | Removable railings for sea-going vessels | Standard not available from MARAD. | N | 1/91 | |
| 12 | DIN | DIN 81709 | Plugs for tubes at guardrails | Standard not available from MARAD. | N | 1/82 | |
| 12 | DIN | DIN 81710 | Inland navigation vessels; railings for decks; requirements, types, design | Standard not available from MARAD. | N | 9/88 | |
| 12 | DIN | DIN 83205 | Railings in ships' engine rooms and boiler rooms | Standard not available from MARAD. | N | 12/84 | |
| 12 | DIN | DIN 83209 | Handrails and footrails at masts, posts and walls on ships | Standard not available from MARAD. | N | 2/82 | |
| 12 | DIN | DIN 83510 | Inland navigation; folding deckrail; stanchion | Standard not available from MARAD. | N | 8/88 | |
| 12 | ISO | 3652 | Shipbuilding - Inland Vessels - Deck Rail First Edition | This standard specifies the characteristics of rope reels intended for the storage of mooring and towing ropes in vessels of all types and purposes for use on inland waterways. | Yes | 15Dec'75 | 1,2,3,4 |
| 12 | ISO | 4868 | Shipbuilding - Guardrails for Cargo Ships First Edition | This standard establishes procedures for gathering and presenting data on vibrations of local structure elements or equipment in sea-going merchant vessels. | Yes | 15Nov'84 | 1,2,3,4 |
| 12 | ISO | ISO 3674 | Shipbuilding; Inland vessels; Deck rail | This standard specifies the types, designs and basic dimensions of ship deck handrails. It discusses tube, network, chain, and rope handrails. | N | 1976-05- | 1,2,3,4 |
| 12 | ISO | ISO 5480 | Shipbuilding; Guardrails for cargo ships | This standard specifies requirements for marine guardrails and stanchions for cargo | N | 1979-07- | 1,2,3,4 |

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| <u>BS Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|-----------------|---------------|--|---|----------------|------------------|-----------------|
| | | | ships to comply with the regulations of the International Convention on Loadlines 1966. | | | |
| 2 JIS | F 2606 | Ships' Wooden Handrails (R 1964) | This standard provides for materials, shape and dimensions for ship's wooden handrails. | Yes | 1958 | 1,2,3,4 |
| 2 JIS | F 2607 | Ships' Handrail Stanchion | This standard provides for material, construction, shape, and dimensions for handrail stanchions for ship use. | Yes | 1975 | 1,2,3,4 |
| 2 MASS | 5.04 | HANDRAILS | Standard not available from MARAD. | Y | | |
| 2 MASS | 79.05 | HANDRAIL; STANCHION | This standard provides specifics on handrails and stanchions, such as materials (steel except around electrical equipment), and dimensions, | Y | 1995 | 1,2,3,4 |
| 2 MASSD | 79.05 | HANDRAIL; STANCHION | This standard provides specifics on handrails and stanchions for Diesel propelled ships, such as materials (steel except around electrical equipment), and dimensions, | Y | 1995 | 1,2,3,4 |
| 2 NNI | NEN-ISO 5480 | Shipbuilding; Guardrails for cargo ships | See the ISO listing with the same number. | N | 1980-05- | |
| 2 SAA | AS 1986 | Shipbuilding - Guardrails for Cargo Ships | Standard not available from MARAD. | Yes | | |
| 2 USCG | 46C177.35 | CONSTRUCTION AND ARRANGEMENT- RAILS AND GUARDS | This standard provides specifics on deck rails Details such as spacing, heights, materials, etc are provided. | Y | 29Sep'60 | 1,2,3,4 |
| 2 USCG | 46C190.25 | CONSTRUCTION AND ARRANGEMENT-RAILS AND GUARDS | This standard provides specifics on merchant vessel rails and guards. Details such as height above decks, number of courses, course spacing, etc. are provided. Storm rails, guards in dangerous places, are also covered. Applicable to ships contracted for | Y | 29Oct'69 | 1,2,3,4 |

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| IBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | | on or after July 1, 1969 | | | | |
| 2 | USCG | 46C72.40 | CONSTRUCTION AND ARRANGEMENT-RAILS AND GUARDS | This standard provides specifics on passenger vessel rails and guards. Details such as height above decks, number of courses, course spacing, etc. are provided. Storm rails, guards in dangerous places, are also covered. Applicable to ships contracted for prior to July 1, 1969. | Y | 30Dec'65 | | |
| 2 | USCG | 46C92.25 | CONSTRUCTION AND ARRANGEMENT-RAILS AND GUARDS | This standard provides specifics on merchant vessel rails and guards. Details such as height above decks, number of courses, course spacing, etc. are provided. Storm rails, guards in dangerous places, are also covered. | Y | 30Dec'65 | 1,2,3,4 | |
| 3 | AFNOR | NF J32-404 | SHIPBUILDING. VERTICAL STEEL LADDERS. | Standard not available from MARAD. | N | 12/85 | | |
| 3 | AFNOR | NF J32-410 | SHIPBUILDING. LADDERS FOR TANKS. | Standard not available from MARAD. | N | 12/85 | | |
| 3 | AFNOR | NF J32-415 | SHIPBUILDING. STEEL DOG-STEP LADDERS. | Standard not available from MARAD. | N | 12/85 | | |
| 3 | AFNOR | NF J32-440 | SHIPBUILDING. PILOT LADDERS. | Standard not available from MARAD. | N | 12/85 | | |
| 3 | AFNOR | NF J32-441 | SHIPBUILDING. EMBARKATION LADDERS. | Standard not available from MARAD. | N | 12/85 | | |
| 3 | AFNOR | NF J32-442 | SHIPBUILDING. ACCOMMODATION LADDERS. | Standard not available from MARAD. | N | 12/85 | | |
| 3 | AFNOR | NF J83-241 | INLAND NAVIGATION. LADDERS FOR HOLDS. | Standard not available from MARAD. | N | 7/66 | | |
| 3 | AFNOR | NF J83-242 | INLAND NAVIGATION. PORTABLE LADDER. | Standard not available from MARAD. | N | 5/67 | | |
| 3 | AFNOR | NF J83-243 | SHIPBUILDING. INLAND NAVIGATION. SHIPS LADDERS. | Standard not available from MARAD. | N | 7/70 | | |

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| IBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 23 | ANSI | 1116 | UL Standard for Safety Marine Chain, Embarkation, and Pilot Ladders First Edition; January 2, 1986, Errata - October 1985 | Standard not available from MARAD. | Yes | | | |
| 23 | ANSI | 14.3 | LADDER | Standard not available from MARAD. | YES | | | |
| 23 | ASTM | F840 | Ladders, Fixed, Vertical, Steel, Ship's, Spec. for | This specification covers fabrication details for fixed, vertical, steel ladders for personnel access on ships. Nonferrous ladders and special-purpose ladders are excluded from this specification. Dimensions, materials, tolerances, etc are provided; however, safety and health practices are not addressed. | Yes | 26Oct'83 | 1,2,3,4 | |
| 23 | BSI | BS 7468 | 1991 Amd 0 Rungs for Dog-Step Ladders (ISO 9519: 1990) | This international standard was adapted from ISO-9519 (1990). This standard specifies the types, dimensions, material, manufacture and designation of rungs for dog-step ladders. It also describes the installation and composition of single rungs forming a dog-step ladder. Dog-step ladders, formed from single rungs, may only be used where fixed vertical ladders with stringers cannot be used. | Yes | 1991 | 1,2,3,4 | |
| 23 | BSI | BS 7468:1991; | Specification for rungs for dog-step ladders | See ISO-95. Standard not available from MARAD. | Y | 8/30/91 | | |
| 23 | BSI | BS MA 39-1 | 1973 Amd 0 Ships' Ladders Part 1: Ladders, Steel Vertical | Part 1 of this standard specifies the dimensions, design and construction, materials and finish for general purpose steel vertical ladders. Part 2 is for "ladders, steel sloping"; Part 3 is for "ladders, steel dog-step"; Part 4 is for " | Yes | Dec'73 | 1,2,3,4 | |

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| IBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
| 3 | BSI | BS MA 39-2 | 1973 Amd 0 Ships' Ladders Part 2: Ladders, Steel Sloping | ladders, wood sloping:. Part 2 of this standard specifies the materials, design and construction, quality of manufacture, finish, inspection and testing for ship's steel sloping ladders. | Yes | Dec'73 | 1,2,3,4 |
| 3 | BSI | BS MA 39-3 | 1973 Amd 1 Ships' Ladders Part 3: Ladders, Steel Dog-Step | Part 3 of this standard specifies the dimensions, design and construction, materials and quality of finish for steel dog-step ladders. | Yes | Dec'73 | 1,2,3,4 |
| 3 | BSI | BS MA 89 | (OBSOLESCE) 1980 Amd 0 Accommodation Ladders (Q) | See also ISO 5488-1979. This standard specifies requirement and the method of test for accommodation ladders used on merchant vessels (excluding passenger ships) to enable persons to embark and disembark safely. The requirements are applicable to either single-flight or multi-flight ladders. | Yes | 1980 | 1,2,3,4 |
| 3 | BSI | BS MA 90 | 1980 Amd 0 Embarkation Ladders | See also ISO 5489-1979. This international standard specifies requirements for an embarkation ladder which is provided for passengers and crew to gain access to a survival craft in an emergency. | Yes | 1980 | 1,2,3,4 |
| 3 | BSI | BS MA 90:1980; | Specification for embarkation ladders | Standard not available from MARAD. | Y | 7/80 | |
| 3 | Bundesam | VG 85204 | Stairs and ladders; step type ladders; dimensions, installation | This standard not available from MARAD. | N | 1/88 | |
| 3 | Bundesam | VG 85207 | Stairs and ladders; ladders; dimensions, installation | This standard not available from MARAD. | N | 11/79 | |
| 3 | Bundesam | VG 85222 Teil | Stairs and ladders; internal stairs; assembly | This standard not available from MARAD. | N | 1/88 | |

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|------------|--------------|----------------|--|---|----------------|------------------|-----------------|
| 23 | Bundesam | VG 85222 Teil | Stairs and ladders; internal stairs; strings | This standard not available from MARAD. | N | 1/88 | |
| 23 | Bundesam | VG 85222 Teil | Stairs and ladders; internal stairs; mud guard | This standard not available from MARAD. | N | 1/88 | |
| 23 | Bundesam | VG 85223 Teil | Stairs and ladders; outside stairs; assembly | Standard not available from MARAD. | N | 9/85 | |
| 23 | Bundesam | VG 85223 Teil | Stairs and ladders; outside stairs; strings | Standard not available from MARAD. | N | 9/85 | |
| 23 | Bundesam | VG 85223 Teil | Stairs and ladders; outside stairs; handrails | Standard not available from MARAD. | N | 9/85 | |
| 23 | Bundesam | VG 85224 | Stairs and ladders; steps | Standard not available from MARAD. | N | 4/92 | |
| 23 | DEF S | NES 2007 | Extending Ladders and Folding Platform Stepladders - Aluminium Alloy Issue 2 (4/89) | Standard not available from MARAD. | Yes | | |
| 23 | DIN | DIN 83200 | Ladders on ships; summary of types, installation | Standard not available from MARAD. | N | 2/76 | |
| 23 | DIN | DIN 83202 Teil | Ladders on ships, light type | Standard not available from MARAD. | N | 1/79 | |
| 23 | DIN | DIN 83202 Teil | Ladders on ships, medium type | Standard not available from MARAD. | N | 1979-02- | |
| 23 | DIN | DIN 83202 Teil | Ladders on ships, heavy type | Standard not available from MARAD. | N | 2/79 | |
| 23 | DIN | DIN 83203 | Rungs of square bar for dog step ladders for walls and masts on ships | Standard not available from MARAD. | N | 3/76 | |
| 23 | DIN | DIN 83204 | Sloping ladders and handrails in ships' engine rooms and boiler rooms; main dimensions, fundamental requirements | Standard not available from MARAD. | N | 3/76 | |
| 23 | DIN | DIN 83206 | Sloping ladders in ships' engine rooms and boiler rooms | Standard not available from MARAD. | N | 5/79 | |
| 23 | DIN | DIN 83207 | Steps for stairs in ships' engine | Standard not available from MARAD. | N | 8/73 | |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
| | | | rooms and boiler rooms | | | | |
| 23 | DIN | DIN 83208 | Protecting plates for sloping ladders in ships' engine rooms and boiler rooms | Standard not available from MARAD. | N | 5/79 | |
| 23 | DIN | DIN 83210 | Sloping ladders for the outside area on ships; treads | Standard not available from MARAD. | N | 2/82 | |
| 23 | DIN | DIN 83214 | Sloping ladders for the outside area on ships; fundamental requirements | Standard not available from MARAD. | N | 2/82 | |
| 23 | DIN | DIN 83215 | Sloping ladders for the outside area on ships; sloping ladders | Standard not available from MARAD. | N | 2/82 | |
| 23 | DIN | DIN 83216 | Sloping ladders for the outside area on ships; railings | Standard not available from MARAD. | N | 2/82 | |
| 23 | DIN | DIN 83217 | Ladders and handrails in ships' cargo tanks; basic requirements | Standard not available from MARAD. | N | 2/84 | |
| 23 | DIN | DIN 83218 | Steel ladders for cargo tanks in vessels | Standard not available from MARAD. | N | 2/84 | |
| 23 | DIN | DIN 83224 | Resting pedests at ladders on ships | Standard not available from MARAD. | N | 2/84 | |
| 23 | DIN | DIN 83225 | Retainers at ladders on ships | Standard not available from MARAD. | N | 2/92 | |
| 23 | DIN | DIN 83226 | Mounted steps | Standard not available from MARAD. | N | 2/92 | |
| 23 | DIN | DIN 83505 | Inland navigation; outboard-ladders | Standard not available from MARAD. | N | 9/83 | |
| 23 | DIN | DIN 83512 | Inland navigation vessels; outboard ladders | Standard not available from MARAD. | N | 12/85 | |
| 23 | DIN | DIN ISO 5489 | Shipbuilding; embarkation ladders; identical with ISO 5489, edition 1986 | See ISO listing with the same number. | N | 2/88 | |
| 23 | DIN | DIN ISO 799 | Shipbuilding; pilot ladders; identical with ISO 799, edition 1986 | See ISO listing with the same number. | N | 1/88 | |

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|------------|--------------|----------------|--|---|----------------|------------------|-----------------|
| 23 | DIN | DIN ISO 9519 | Shipbuilding and marine structures; rungs for dog-step ladders; identical with ISO 9519:1990 | See ISO listing with the same number. | N | 4/92 | |
| 23 | DOD | MIL-L-17067B | LADDER, BERTH, ADJUSTABLE (ALUMINUM) (MSTS PASSENGER SHIPS) | Standard not available from MARAD. | Y | | |
| 23 | DOD | MIL-L-17447 | LADDER, DEBARKATION; FIBER ROPE (USE NAVSEA 804-51842250002) | This specification has been cancelled. | Y | | |
| 23 | DOD | MIL-L-221C | LADDERS, JACOB'S | This specification has been cancelled. This specification covers flexible embarkation and debarkation ladders. It specifies materials, construction techniques, workmanship, etc. | Y | 21May'57 | 1,2,3,4 |
| 23 | DOD | MIL-STD-2151 | INCLINED LADDER TREAD TEST METHODS AND EQUIPMENT FOR WEAR, SLIP-RESISTANCE AND IMPACT | This standard describes test methods and equipment for testing compound filled ladder treads intended for use on Navy ships for wear, slip-resistance and impact resistance. | Y | 21Mar'91 | 1,2,3,4 |
| 23 | DOD | MIL-T-24634 | TREADS, COMPOUND-FILLED, FOR INCLINED LADDERS | This specification covers full treads and cap treads which have slip-resistant compound-filled dovetail grooves in extruded aluminum bases. | Y | 25Jul'84 | 1,2,3,4 |
| 23 | FED-SPEC | RR-L-91D | LADDER | This standard not available from MARAD. | Y | | |
| 23 | ISO | 3796 | Shipbuilding - Vertical Steel Ladders First Edition | This standard lays down nominal sizes for clear openings through the frames for all types of external single-leaf doors, on board ships, for which coamings are required. | Yes | 30Sep'76 | 1,2,3,4 |
| 23 | ISO | 5485 | Shipbuilding - Steel Dog-Step Ladders First Edition (Replaced by 9519-90) | This standard specifies the technical requirements and main dimensions of fixed steel deck stairs, used in inland vessels. | Yes | 1Dec'86 | 1,2,3,4 |
| 23 | ISO | 5487 | Shipbuilding - Accommodation Ladders | This standard specifies the dimensions, | Yes | 1Sep'81 | 1,2,3,4 |

STRUCTURE

| age 13 | | | | | | | | |
|--------|-------|----------|--|---|---------|-----------|----------|--|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | First Edition | materials, construction and installation of steel dog-step ladders. | | | | |
| 23 | ISO | 5488 | Shipbuilding - Embarkation Ladders Second Edition | This standard specifies requirements and the method of test for accommodation ladders used on merchant vessels (excluding passenger ships) to enable persons to embark and disembark safely. The requirements are applicable to either single-flight or multi-flight ladders. | Yes | 15Oct'79 | 1,2,3,4 | |
| 23 | ISO | 657 PT 1 | Shipbuilding - Pilot Ladders Second Edition | This part of ISO-657 specifies dimensions of hot-rolled equal-leg angles. | Yes | 8/1/89 | 1,2,3,4 | |
| 23 | ISO | 7255 | Shipbuilding and Marine Structures - Deck Machinery - Accommodation Ladder Winches First Edition | This standard title (from the database) is wrong. The correct title is Shipbuilding - Active control of ships - vocabulary. This standard defines terms applying to active control units of ships. | Yes | 15Dec'85 | 1,2,3,4 | |
| 23 | ISO | 9437 | Shipbuilding and Marine Structures - Rungs for Dog-Step Ladders First Edition | This standard has the wrong title in the database. The correct title is: Shipbuilding - Inland Vessels - Mastrosov Anchors. This standard species the technical characteristics and dimensions of Mastrosov anchors for inland vessels. | Yes | 1Dec'86 | 1,2,3,4 | |
| 23 | ISO | ISO 3797 | Shipbuilding; Vertical steel ladders | This standard specifies the main dimensions and characteristics for vertical steel ladders to be fitted on board ships in small holds, between deck spaces, on masts, kingposts, trunks, deck-house tops, maintenance platforms and for similar applications. | Y | 9/76 | 1,2,3,4 | |
| 23 | ISO | ISO 5485 | Shipbuilding; Inland vessels; Fixed steel deck stairs | Standard not available from MARAD. | Y | 12/86 | | |

STRUCTURE

age 14

| <u>WBS</u> | <u>Organ</u> | <u>Std-No.</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|----------------|--|---|----------------|------------------|-----------------|
| 23 | ISO | ISO 5488 | Shipbuilding; Accommodation ladders | Standard not available from MARAD. | Y | 10/79 | |
| 23 | ISO | ISO 5489 | Shipbuilding; Embarkation ladders | This standard specifies requirements for an embarkation ladder which is provided for passengers and crew to gain access to a survival craft in an emergency. | Y | 10/86 | 1,2,3,4 |
| 23 | ISO | ISO 799 | Shipbuilding; Pilot ladders | This international standard specifies requirements for a ship's pilot ladder which is provided for a pilot to embark and disembark safely. It specifies material, construction techniques, dimensions, etc. | Y | 10/86 | 1,2,3,4 |
| 23 | ISO | ISO 9519 | Shipbuilding and marine structures; rungs for dog-step ladders | This standard specifies the types, dimensions, material, manufacture and designation of rungs for dog-step ladders; it also lays down the installation and composition of single rungs forming a dog-step ladder. | Y | 11/90 | 1,2,3,4 |
| 23 | JIS | F 2601 | Ships' Dog Steps | This standard provides for ship's footsteps (similar to dog-step), material, shape and dimensions, classification, etc. | Y | 1975 | 1,2,3,4 |
| 23 | JIS | F 2601 | Ships' Footsteps | ThThis standard provides for ship's footsteps (similar to dog-step), material, shape and dimensions, classification, etc. | Yes | 1975 | 1,2,3,4 |
| 23 | JIS | F 2602 | Ships' Steel Vertical Ladders | This standard provides for steel vertical ladders for ship's deckhouses, mast, etc. It provides classification, shape and dimension, material, etc. | Y | 1975 | 1,2,3,4 |
| 23 | JIS | F 2603 | Steel Deck Ladders | This standard provides for steel deck ladders used mainly on exposed parts of the ship. It provides for materials, construction, shape and dimensions. | Yes | 1970 | 1,2,3,4 |

STRUCTURE

| Page | 15 | | | | | | |
|------|-------|--------|---|--|---------|-----------|----------|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
| 23 | JIS | F 2605 | Steel Accommodation Ladders for Small Ships | This standard provides for steel accommodation ladders for small non-passenger ships. It provides classification, composition, construction, shape and dimensions, etc. | Yes | 1975 | 1,2,3,4 |
| 23 | JIS | F 2605 | Small Size Steel Accommodation Ladders | Standard not available from MARAD. | | | |
| 23 | JIS | F 2612 | Steel Wharf Ladders | This standard provides for classification, materials, construction, shape, and dimensions for steel wharf ladders for ship use. | Y | 1967 | 1,2,3,4 |
| 23 | JIS | F 2613 | Aluminium Alloy Wharf Ladders | This standard provides for classification, materials, construction, shape and dimensions for aluminum alloy wharf ladders for ship use. | Y | 1967 | 1,2,3,4 |
| 23 | JIS | F 2613 | Aluminium Alloy Wharf Ladders (R 1976) | Standard not available from MARAD. | Yes | | |
| 23 | JIS | F 2614 | Bulwark Ladders | This standard provides details for two (wood and steel) bulwark ladders for ship board use. Details as to materials, construction details, shape and dimensions are provided. | Yes | 1967 | 1,2,3,4 |
| 23 | JIS | F 2615 | Pilot Ladders | This standard provides specifics on rope ladders for a pilot's embarking use. Details on materials, construction techniques, shape and dimensions are provided. | Y | 1969 | 1,2,3,4 |
| 23 | JIS | F 2617 | Embarkation Ladders | This standard provides specifics on rope ladders used for embarking on life boats or life rafts. It provides details as to materials, construction techniques, shape and dimensions. | Y | 1974 | 1,2,3,4 |

STRUCTURE

age 16

| <u>WBS</u> | <u>Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|---------------|---|--|----------------|------------------|-----------------|
| 23 | JIS | F 2621 | Accommodation Ladders | Standard not available from MARAD. | | | |
| 23 | JIS | F 2622 | Pilot Accommodation Ladders | Standard not available from MARAD. | | | |
| 23 | JIS | F 3612 | Rope Ladders | This standard provides specifics on rope ladders for ship board use. It provides details as to materials, shape and dimensions. | Y | 1974 | 1,2,3,4 |
| 23 | JIS | F 7502 | Marine Steel Ladders and Steel Handrails | Standard not available from MARAD. | | | |
| 23 | MASS | 5.03 | LADDER; STAIRWAY | This standard provides specifics on ladders and stairways. Details such materials, installation slopes, treads, and dimensions for accommodation ladders, inclined ladders, vertical ladders, cargo hold ladders, and pilot's ladders - Hoist. | Y | 1995 | 1,2,3,4 |
| 23 | MASS | 79.02 | LADDER; FLOORPLATE | | | | |
| 23 | MASS | 81.07 | ACCOMMODATION LADDER WINCH; WINCH, ACCOMMODATION LADDER | This standard provides some specifics on accommodation ladder winches such as: motor must be reversible and rated for 15 minute short time, full load duty, must be equipped with an electric brake, etc. | Y | 1995 | 1,2,3,4 |
| 23 | MASSD | 79.01 | LADDER; GRATING; FLOORPLATE | This standard provides specifics on ladders, walkways, floors and platforms. It details safety requirements such as what is required in the way of stanchions, handrails, toe plates, and fastenings; all should be easily removable for access as required. It also provides details as to floor plating, gratings, and walkways. | Y | 1995 | 1,2,3,4 |
| 23 | MASSD | 79.02 | LADDER | Standard not available from MARAD. | | | |
| 23 | MASSD | 81.07 | ACCOMMODATION LADDER WINCH; WINCH, | This standard provides some specifics on | Y | 1995 | 1,2,3,4 |

STRUCTURE

age 17

| <u>WBS</u> | <u>Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|---------------|---|---|----------------|----------------------|---------------------|
| | | | ACCOMMODATION LADDER | accommodation ladder winches for diesel propelled ships such as: motor must be reversible and rated for 15 minute short time, full load duty, must be equipped with an electric brake, etc. | | | |
| 23 | NNI | NEN-ISO 3797 | Shipbuilding; Steel ladders | See the ISO listing with the same number. | N | 10/76 | |
| 23 | NNI | NEN-ISO 5487 | Shipbuilding; Steel dog-step ladders | See the ISO listing with the same number. | N | 10/83 | |
| 23 | NNI | NEN-ISO 5488 | Shipbuilding; Accommodation ladders | See the ISO listing with the same number. | N | 9/80 | |
| 23 | NNI | NEN-ISO 5489 | Shipbuilding; Embarkation ladder | See the ISO listing with the same number. | N | 2/87 | |
| 23 | NNI | NEN-ISO 7364 | Shipbuilding and marine structures; Deck machinery; Accommodation ladder winches | See the ISO listing with the same number. | N | 4/84 | |
| 23 | NNI | NEN-ISO 799 | Pilot ladders | See the ISO listing with the same number. | N | 2/87 | |
| 23 | NNI | NEN-ISO 9519 | Shipbuilding and maritime structures; Rungs for dog-step ladders | See the ISO listing with the same number. | N | 11/90 | |
| 23 | SAA | AS 1035 | Steel Ladders for Ships - Vertical Ladders | Standard not available from MARAD. | Yes | | |
| 23 | SAA | AS 1036 | Steel Ladders for Ships - Inclined Ladders for Machinery Spaces | Standard not available from MARAD. | Yes | | |
| 23 | SAA | AS 1037 | Steel Ladders for Ships - Inclined Ladders for Use in Other Than Machinery Spaces | Standard not available from MARAD. | Yes | | |
| 23 | UL | 1116 | UL Standard for Safety Marine Chain, Embarkation, and Pilot Ladders First Edition; January 2, 1986, Errata - October 1985 | This standard provides specifics on marine chain ladders, marine embarkation ladders, and marine pilot ladders intended for use on merchant vessels along a vertical portion of the hull. Details as to materials, construction, protection from corrosion, etc | Yes | 2Jan'86 | 1,2,3,4 |

STRUCTURE

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| YBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|------------|--|--|---------|-----------|----------|
| 13 | USCG | 46C160.017 | LADDER, EMBARCATION-DEBARKATION, FLEXIBLE | are provided. This subpart contains standards and approval and production tests for chain ladders used on merchant vessels to get on or off the vessel in an emergency. Details as to materials, testing marking, etc are provided. | Y | 31Dec'81 | 1,2,3,4 |
| 13 | USCG | 46C163.002 | CONSTRUCTION-PILOT HOIST | This subpart contains standards and approval and production tests for pilot hoists used on merchant vessels. Details as to approval procedures, materials, construction techniques, etc. are provided. | Y | 31Dec'81 | 1,2,3,4 |
| 13 | CEN | PREN526 | GANGWAYS WITH A LENGTH NOT EXCEEDING 8 m - REQUIREMENTS, TYPES | This standard applies to gangways on inland navigation vessels except those gangways intended for passengers. It specifies types, main dimensions, and test conditions which have to be observed for safety reasons. | Y | JUL 91 | INLAND |
| 13 | CEN | PREN711 | INLAND NAVIGATION RULES - RAILINGS FOR DECKS - REQUIREMENTS, TYPES | This European standard is applicable to railings for decks on inland navigation vessels. It lays down design, dimensions, strength and test conditions which have to be observed for safety reasons. These railings provide protection for persons against falling over-board and from one deck to the next. | Y | 3/92 | INLAND |
| 13 | ASTM | F-783 | STANDARD SPECIFICATION FOR STAPLE, HANDGRAB, HANDLE, AND STIRRUP RUNG. | This specification provides design, construction for steel staples, handgrabs, handles, and individual stirrup rungs. The staples, handgrabs, and handles depicted in this specification are for use on steel | Y | 5/93 | 1,2,3,4 |

STRUCTURE

| Page 19 | WBS Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|---------|-----------|-------------|---|--|---------|-----------|----------|
| | | | | structures including all parts of ship's structure as necessary. The individual stirrup rungs are for use on bulkheads or structure as deemed necessary. | | | |
| 23 | CEN | PREN790 | INLAND NAVIGATION VESSELS - STAIRS WITH INCLINATION ANGLES NOT EXCEEDING 60 DEGREES - REQUIREMENTS, TYPES | This standard applies to stairs with inclination angles not exceeding 60 degrees for use in working areas of inland navigation vessels. Included are: safety requirements, design requirements, safety dimensions, treads, handrails, etc. | Y | 6/92 | INLAND |
| 23 | ISO | ISO-7364 | SHIPBUILDING AND MARINE STRUCTURES - DECK MACHINERY - ACCOMMODATION LADDER WINCHES | This international standard specifies requirements and characteristics of lightly powered ship's accommodation ladder winches provided with electric, hydraulic or pneumatic drive and unpowered ship's accommodation winches. Design, operation, and testing specifications are provided. | Y | 5/15/83 | 1,2,3,4 |
| 23 | PCC | 35CFR103.18 | PILOT LADDER, HOISTS AND SIDE PORTS | A vessel shall, weather permitting, have both an accommodation ladder and pilot ladder rigged and ready for use upon arrival in Canal waters. This specification provides guidance as to these requirements. | Y | 9/16/66 | 1,2,3,4 |

VENTILATION

| Page 1 | | | | | | | |
|--------|-------|------------|--|---|---------|-----------|----------|
| SWBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
| 509 | DOD | C-788F(NU) | BRATTICE CLOTH, CLOTH, COTTON BRATTICE, INSULATION, THERMAL | This standard covers the requirements for a type of cotton brattice cloth with a flame retardant finish used in conjunction with an adhesive for repairing and covering fibrous glass insulation board. | Yes | 20Aug81 | 1,2,3,4 |
| 509 | MASS | 12.12 | VENTILATION INSULATION AND LAGGING | Specifies insulation for ventilation, heating and air conditioning systems to prevent sweating and external heat transfer. | Yes | '95 | 1,2,3,4 |
| 509 | MASS | 12.13 | ACOUSTIC INSULATION, INSULATION, ACOUSTIC | Specifies acoustical insulation to attenuate system-generated noise to levels specified in MASS Section 1, Article 11. | Yes | '95 | 1,2,3,4 |
| 509 | MASSD | 12.12 | VENTILATION INSULATION AND LAGGING | Specifies insulating materials required (as specified by the regulatory bodies) to prevent sweating and external heat transfer. | Yes | '95 | 1,2,3,4 |
| 509 | MASSD | 12.13 | ACOUSTIC INSULATION, INSULATION, ACOUSTIC | Specifies acoustic insulation required to attenuate system generated noise for diesel propelled vessels. | Yes | '95 | 1,2,3,4 |
| 511 | DNV | PT5.4.7 | CARGO HEATING AND COOLING ARRANGEMENTS | This standard provides general guidance for cargo heating and cooling arrangements. Some specifics: heating and cooling media are to be compatible with the cargo, heating/cooling systems require isolation valves, heating and cooling lines can only penetrate tanks from the top, cargo heating system must provide a way to monitor temperature, etc. Well written guidance with a lot of details. | YES | JUL93 | 1,2,3,4 |
| 511 | DNV | PT5.5.7 | CARGO PRESSURE/TEMPERATURE CONTROL, CARGO HEATING ARRANGEMENTS, INSULATION | This standard provides guidance as to: general cargo pressure/temperature control including cargo refrigeration/reliquefaction | YES | JUL93 | 1,2,3,4 |

VENTILATION

Page 2

| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|---------------|--|--|---------|-----------|----------|
| | | | | systems, general guidance as to cargo heating arrangements, insulation for tanks, hold spaces and pipelines including materials, fixing and protection of insulating materials, inspection of insulation and non-cooled cargo tanks exposed to sun radiation. Well written guidance with a lot of details. | | | |
| 11 | DOD | MIL-H-16235-C | HEATERS, VENTILATION, DUCT TYPE SHIPBOARD | This specification covers duct type ventilation heaters for use in heating, ventilating, and air conditioning systems aboard ships. Design, construction and material requirements are provided. | Yes | 29 | 1,2,3,4 |
| 11 | DOD | QPL-16235-23 | HEATERS, VENTILATION, DUCT TYPE, SHIPBOARD | Provides a list of NAVSEA approved, qualified vendors for shipboard heaters/ventilators, duct type. | Yes | 15Dec'89 | 1,2,3,4 |
| 11 | MASS | 12.5 | STEAM HEATING AND AIR CONDITIONING WATER SYSTEMS | This section provides guidance for steam heating and air conditioning water systems, including such things as: where steam heating systems are required, and general guidance as to chilled water systems. | YES | NOV95 | 1,2,3,4 |
| 11 | UL | 1812 | DUCTED HEAT RECOVERY VENTILATORS | These requirements cover ducted heat recovery ventilators intended to remove air from buildings, replace it with outside air, and in the process transfer heat from the warmer to the colder air. NOTE: these requirements may not be directly applicable to some marine applications. | YES | JUN23'95 | INDUSTR |
| 11 | UL | 1815 | NON-DUCTED HEAT RECOVERY VENTILATORS | These requirements cover non-ducted, stationary or fixed heat recovery ventilators for household, commercial, or | YES | APR11'95 | INDUSTR |

VENTILATION

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| WBS Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App |
|-----------|------------|---|--|---------|-----------|----------|
| | | | industrial use and are intended to be employed in accordance with the National Electric Code, NFPA 70. These requirements cover heat recovery ventilators that may employ short ducts intended to bring air to and from equipment. CAUTION: these requirements may not be directly applicable to some marine applications. | | | |
| 11 UL | 1996 | DUCT HEATERS | These requirements cover duct heaters and remote control assemblies for such equipment, rated at 600 volts or less to be employed in ordinary locations in accordance with the National Electric Code ANSI/NFPA 70. CAUTION: Some of the requirements may not be directly applicable to marine applications. | YES | 12/29/93 | INDUSTR |
| 12 ABS | ABS 20.9 | CONSTRUCTION OF COAMINGS | Ventilators on exposed freeboard or superstructure decks to spaces below the freeboard deck or decks of enclosed superstructures require coamings of steel or other equivalent material. This standard specifies coaming plate thickness, height, and means for closing openings in ventilators. | YES | | 1,2,3,4 |
| 12 ABS03 | 7.9.2 | VENTILATION DUCT AND FITTINGS, DRILLING UNIT | Standard not available from MARAD. | Yes | | |
| 12 AFNOR | NF J46-110 | SHIPBUILDING. INLET VENTILATORS. HEMISPHERICAL COWLS. | Standard not available from MARAD. | N | 1/51 | |
| 12 AFNOR | NF J46-116 | SHIPBUILDING. INLET VENTILATORS. FIXED HEAD TYPE. | Standard not available from MARAD. | N | 1/51 | |
| 12 AFNOR | NF J46-120 | SHIPBUILDING. VENTILATORS. | Standard not available from MARAD. | N | 10/51 | |

VENTILATION

| age | 4 | | | | | | |
|-----|-------|------------|--|--|---------|-----------|----------|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
| | | | DETACHABLE BODY. | | | | |
| 12 | AFNOR | NF J46-122 | SHIPBUILDING. VENTILATORS. BASE. | Standard not available from MARAD. | N | 10/51 | |
| 12 | AFNOR | NF J46-124 | SHIPBUILDING. VENTILATORS. INNER CAP. | Standard not available from MARAD. | N | 10/51 | |
| 12 | AFNOR | NF J46-126 | SHIPBUILDING. VENTILATORS. HANDLE AND LOCKING SCREW. | Standard not available from MARAD. | N | 10/51 | |
| 12 | AFNOR | NF J46-128 | SHIPBUILDING. VENTILATORS. LIFTING BRACKET AND DIRT TRAPS. | Standard not available from MARAD. | N | 10/51 | |
| 12 | AFNOR | NF J46-210 | SHIPBUILDING. OUTLET VENTILATORS. SWIVEL HEAD. | Standard not available from MARAD. | N | 10/51 | |
| 12 | AFNOR | NF J46-212 | SHIPBUILDING. OUTLET VENTILATORS. FIXED HEAD (TYPE I). | Standard not available from MARAD. | N | 10/51 | |
| 12 | AFNOR | NF J45-131 | SHIPBUILDING. VENTILATORS CLOSED WITH SCREW-OPERATED COVERS,MADE FROM STEEL PLATE OR TUBE. | Standard not available from MARAD. | N | 11/87 | |
| 12 | ANSI | 1136 | UL Standard for Safety Marine Rigid and Flexible Air Ducting Second Edition | Standard not available from MARAD. | Yes | | |
| 12 | BSI | BS MA 69 | 1976 Amd 1 Ventilator Heads | This British standard specifies four types of ventilator heads for general use on board ships. The four types: fixed mushroom ventilator, Type A, adjustable mushroom ventilator, Type B, Adjustable mushroom ventilators, Type C, and Circular head Cowl ventilator, Type D. Specific provided: nominal sizes and dimensions, materials, tolerances, etc. | Yes | 1976 | 1,2,3,4 |
| 12 | BSI | BS MA 10 | 1986 Amd 0 Design Conditions and Basis of Calculations for | Standard not available from MARAD. | Yes | | |

VENTILATION

| age | 5 | | | | | | |
|------------|--------------|----------------|---|---|----------------|------------------|-----------------|
| <u>WBS</u> | <u>Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
| | | | Air-Conditioning and Ventilation of Accomodation Spaces in Ships | | | | |
| 12 | BSI | BS MA 103:1986 | Specification for design conditions and basis of calculations for air-conditioning and ventilation of accommodation spaces in ships | This standard is technically similar in all respects to ISO-7547-1985 "Air Conditioning and Ventilation of Accomodation Spaces on Board Ships". This standard specifies design conditions and suitable methods of calculation for air-conditioning and ventilation of accomodation spaces and the radio cabin on sea-going vessels. | Y | 11/86 | 1,2,3,4 |
| 12 | BSI | BS MA 105:Part | Series 3 shipborne barges. Specification for principal mating dimensions for the ventilating system | Standard not available from MARAD. | Y | 7/87 | |
| 12 | BSI | 86/72561 DC | Air-conditioning and ventilation of machinery control-rooms on board ships - design conditions and basis of calculations (ISO/DIS 8862) | Standard not available from MARAD. | Y | 5/86 | |
| 12 | BSI | 86/72563 DC | Air-conditioning and ventilation of wheelhouse on board ships - design conditions and basis of calculations (ISO/DIS 8864) | Standard not available from MARAD. | Y | 5/86 | |
| 12 | BSI | 86/74517 DC | Air-conditioning and ventilation of dry provision rooms on board ships. Design conditions and basis of calculations (ISO/DIS 9099) | Standard not available from MARAD. | Y | 7/ 86 | |
| 12 | BSI | 87/76385 DC | Specification for shipbuilding. Engine-room ventilation in diesel-engined ships. Design requirements and basis of calculations (ISO/DIS 8861) | Standard not available from MARAD. | Y | 10/87 | |

VENTILATION

| age | 6 | | | | | | |
|-----|----------|---------------|---|------------------------------------|---------|-----------|----------|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
| 12 | BSI | 88/78439 DC | Shipbuilding. Ventilation of cargo spaces where internal combustion engines may be driven. Calculation of theoretical total airflow required (ISO/DIS 9785) | Standard not available from MARAD. | Y | 1/87 | |
| 12 | Bundesam | VG 85563 Teil | Fire retardend ventilations; assembly | Standard not available from MARAD. | N | 9/89 | |
| 12 | Bundesam | VG 85563 Teil | Fire retardend ventilations; components | Standard not available from MARAD. | N | 9/89 | |
| 12 | Bundesam | VG 85623 | Ventilation plants for ships; concepts | Standard not available from MARAD. | N | 9/87 | |
| 12 | Bundesam | VG 85625 | Gas- and watertight ventilation flaps; technical specification | Standard not available from MARAD. | N | 2/91 | |
| 12 | Bundesam | VG 85626 | Supply air outlets and exhaust air inlets; technical specification | Standard not available from MARAD. | N | 4/85 | |
| 12 | DIN | DIN 82330 | Round flanges DN 250 to DN 1800 for thick wall tubes of ventilation plants in ships and industrial premises | Standard not available from MARAD. | N | 9/89 | |
| 12 | DIN | DIN 82331 | Gaskets for round flanges according to DIN 82330 | Standard not available from MARAD. | N | 9/89 | |
| 12 | DIN | DIN 82341 | Ventilation plants on board ships; mushroom ventilator heads | Standard not available from MARAD. | N | 8/89 | |
| 12 | DIN | DIN 82342 | Ventilation plants on board ships; discharge ventilator heads | Standard not available from MARAD. | N | 1/89 | |
| 12 | DIN | DIN 83409 | Ventilator flaps, weathertight | Standard not available from MARAD. | N | 1/87 | |
| 12 | DIN | DIN 83410 | Inserts for ventilator flaps | Standard not available from MARAD. | N | 1/87 | |
| 12 | DIN | DIN ISO 7547 | Air-conditioning and ventilation of | Standard not available from MARAD. | N | 3/90 | |

VENTILATION

| Page | 7 | | | | | | | |
|------|-------|--------------|---|---|---------|-----------|-----------|--|
| WBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App. | |
| | | | accommodation spaces on board ships; design conditions and basis of calculations; identical with ISO 7547:1985 | | | | | |
| 12 | DIN | DIN ISO 8861 | Shipbuilding; engine-room ventilation in diesel-engined ships; design requirements and basis of calculations; identical with ISO 8861:1988 | Standard not available from MARAD. | N | 11/90 | | |
| 12 | DIN | DIN ISO 8862 | Air-conditioning and ventilation of machinery control-rooms on board ships; design conditions and basis of calculations; identical with ISO 8862:1987 | Standard not available from MARAD. | N | 3/90 | | |
| 12 | DIN | DIN ISO 8864 | Air-conditioning and ventilation of wheelhouse on board ships; design conditions and basis of calculations; identical with ISO 8864:1987 | Standard not available from MARAD. | N | 3/90 | | |
| 12 | DIN | DIN ISO 9099 | Air-conditioning and ventilation of dry provision rooms on board ships; design conditions and basis of calculations; identical with ISO 9099:1987 | Standard not available from MARAD. | N | 3/90 | | |
| 12 | DNV | PT4.6.10 | VENTILATION SYSTEMS, GENERAL REQUIREMENTS | This standard specifies: ventilation ducts (in excess of 2 meters/cross-section less than .02M) shall be of non-combustionable materials, ducts passing through a free cross-sectional area must be lined with a steel sleeve, machinery space ducts are not to pass through accommodation spaces and | YES | JUL93 | 1,2,3,4 | |

VENTILATION

| Age | 8 | | | | | | | |
|-----|-------|----------|---|---|---------|-----------|----------|--|
| NBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | | vice versa, galley ventilation systems are to be separate from other ventilation systems, etc. Well written guidance with a lot of details. | | | | |
| 12 | DNV | PT5.3.5 | GAS-FREEING AND VENTING OF CARGO TANKS | This standard provides guidance for gas-freeing of cargo tanks. Numerous general requirements are specified: supply line from the fan is to have a shut-off valve and a non-return valve in series, steam lines ending in cargo spaces or cargo pipe systems are to be provided with non-return valves, the gas-freeing system is to be used exclusively for ventilating and gas-freeing, all cargo tanks are required to have venting system and breathing system (these systems may be independent or combined), etc. This standard also provides guidance for barges. Well written guidance with a lot of details. | YES | JUL93 | 1,2,3,4 | |
| 12 | DNV | PT5.3.6 | VENTILATION SYSTEMS WITHIN THE CARGO AREA OUTSIDE THE CARGO TANKS | This standard provides general guidance for ventilation systems within the cargo area and outside cargo tanks. Guidance provided includes: general safety requirement, fans are to be designed with least possible sparking, materials, clearances between the impeller and duct, ventilation of cargo handling spaces, ventilation of spaces not normally entered, etc. Well written guidance with a lot of details. | YES | JUL93 | 1,2,3,4 | |
| 12 | DNV | PT5.4.10 | MECHANICAL VENTILATION IN THE CARGO AREA | This standard provides general guidance for mechanical ventilation in the cargo area. Some specifics: system requirements such as | YES | JUL93 | 1,2,3,4 | |

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| WBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|-------------|---|--|---------|-----------|----------|
| | | | | fans with in the cargo area (electric fans are not to be installed in ventilation ducts for cargo handling spaces), requirements for ventilation of cargo handling spaces, ventilation of spaces not normally entered, safety, etc. Well written guidance with a lot of details. | | | |
| 12 | DNV | PT5.5.10 | MECHANICAL VENTILATION IN CARGO AREA | This standard provides guidance for mechanical ventilation in the cargo areas. Guidance provided includes: general system requirements, specifics on fans in the cargo areas, ventilation of cargo handling spaces, and ventilation of spaces not normally entered. Well written guidance with a lot of details. | YES | JUL93 | 1,2,3,4 |
| 12 | DNV | PT5.9.4 | HAZARDOUS AREAS AND VENTILATION | This standard provides guidance as to ventilation of hazardous and non-hazardous areas. Specifics are provided on: general applications and definitions; specification of hazardous areas, openings, access and ventilation conditions affecting the extent of hazardous areas, and ventilation of spaces in general. Well written guidance with a lot of details. | YES | JUL93 | 1,2,3,4 |
| 12 | DOD | QPL-17548-9 | FLAME ARRESTER, VENTILATION-EXHAUST (NAVAL SHIPBOARD USE) | Standard not available from MARAD. | Yes | | warship |
| 12 | DOD | MIL-T-22576 | TERMINALS, AIR, DIFFUSING, CIRCULAR FOR SHIPBOARD USE | This specification covers air supply terminals of the diffusing type for use in ventilating and air conditioning systems on Naval ships. | Yes | 10Jan'64 | warship |
| 12 | DOD | QPL-2939-21 | COOLING COILS, AIR, DUCT TYPE AND | Provides a list of manufacturers that are | Yes | 27Mar'89 | warship |

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| <u>WBS</u> | <u>Organ</u> | <u>Std-No.</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|----------------|--|---|----------------|------------------|-----------------|
| | | | GRAVITY TYPE; COOLER UNITS, AIR, NAVAL SHIPBOARD ENVIRONMENTAL CONTROL SYSTEMS | qualified to provide cooling coils, air, duct type, and gravity type for use on Naval vessels. | | | |
| 12 | GL | GL 19 | Guidelines for air conditioning systems aboard sea-going vessels | Standard not available from MARAD. | N | 94 | |
| 12 | ISO | 8304 | Shipbuilding - Shipborne Barges, Series 3 - Ventilation System - Principal Mating Dimensions First Edition | The database shows this standard as ISO 8303 vice 8304. This standard provides mating dimensions for the joining of shipborne barges to the ventilation systems of barge-carriers by means of flexible hoses. | Yes | 15Dec'84 | Barges |
| 12 | ISO | 8729 | Shipbuilding - Engine- Room Ventilation in Diesel-Engined Ships - Design Requirements and Basis of Calculations First Edition; Reprinted - 1988 | This standard is mis-named in the database. The correct title is "Marine Radar Reflectors". | Yes | 1Nov'87 | |
| 12 | ISO | 9785 | Shipbuilding - Ventilation of Cargo Spaces Where Internal Combustion Engine Vehicles May Be Driven - Calculation of Theoretical Total Airflow Required First Edition; (Corrigendum 1 | The database shows this as ISO 9519 vice ISO 9785. This standard specifies methods of calculating the theoretical quantity of outdoor air required in cargo spaces where internal combustion engines are used, in order to dilute air to within the permitted occupational exposure limits. | Yes | 15Feb'91 | 1,2,3,4 |
| .2 | ISO | ISO/R 644 | Conventional signs to be used in schemes for the installations of ventilation systems in ships | This standard provides drawing symbols and conventional signs for ducts, duct joints, appliances, fittings, and ventilators. | Yes | 12/67 | 1,2,3,4 |
| .2 | ISO | ISO 3372 | Shipbuilding; Inland vessels; Mushroom-type ventilator heads | Defines two types of mushroom ventilators used on vessels for inland waterways and specifies their principal dimensions. There are two types: Type I: Mushroom-type locking ventilator heads with top control; Type II: Mushroom-type locking ventilator | Yes | 5/75 | Inland |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|----------|---|---|---------|-----------|----------|
| | | | | heads with button control. The JIS F-2407 standard provides significantly more information than this ISO standard. | | | |
| 12 | ISO | ISO 5571 | Shipbuilding; Identification colours for schemes for ventilation systems | This international standard specifies colors for plans to be used for ventilation systems on board ships, for those conditions where identification by color is required. | Yes | 4/81 | 1,2,3,4 |
| 12 | ISO | ISO 7547 | Air-conditioning and ventilation of accommodation spaces on board ships; Design conditions and basis of calculations | This standard specifies design conditions and suitable methods of calculation for air-conditioning and ventilation of accommodation spaces and the radio cabin on board seagoing merchant vessels for all conditions except in extremely cold or hot climates. | Yes | 11/85 | 1,2,3,4 |
| 12 | ISO | ISO 8304 | Shipbuilding; Shipborne barges, series 3; Ventilation system; Principal mating dimensions | This standard specifies the principal mating dimensions of the ventilation system of shipborne barges series 3. Provides for the joining up of barges to the ventilation system of the barge-carrier by means of flexible hoses when cargoes requiring ventilation are transported. | Yes | 12/84 | Barges |
| 12 | ISO | ISO 8861 | Shipbuilding; engine-room ventilation in diesel-engined ships; design requirements and basis of calculations | This standard specifies design requirements and suitable calculation methods for the ventilation of the engine-room in merchant seagoing diesel-engined ships, for normal conditions in all waters. | Yes | 11/88 | 1,2,3,4 |
| 12 | ISO | ISO 8862 | Air-conditioning and ventilation of machinery control-rooms on board ships; Design conditions and basis of calculations | This standard specifies design conditions and suitable methods of calculation for air-conditioning and ventilation of accommodation spaces and the radio cabin on board seagoing merchant vessels for all | Yes | 1Mar'87 | 1,2,3,4 |

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|------|-------|----------|---|--|---------|-----------|----------|--|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 12 | ISO | ISO 8864 | Air-conditioning and ventilation of wheelhouse on board ships; Design conditions and basis of calculations | conditions except in extremely cold or hot climates and is based on ISO-7547. This standard specifies design conditions and suitable methods of calculation for air-conditioning and ventilation of the wheel house on board seagoing merchant vessels for all conditions except in extremely cold or hot climates. Is based on ISO 7547. | Yes | 3/87 | 1,2,3,4 | |
| 2 | ISO | ISO 9099 | Air-conditioning and ventilation of dry provision rooms on board ships; Design conditions and basis of calculations | This standard specifies design conditions and suitable methods of calculation for air-conditioning and ventilation of dry provision store rooms on board seagoing merchant vessels for all conditions except in extremely cold or hot climates. It is based on ISO 7547. | Yes | 4/87 | 1,2,3,4 | |
| 2 | ISO | ISO 9785 | Shipbuilding; ventilation of cargo spaces where internal combustion engine vehicles may be driven; calculation of theoretical total airflow required | This standard specifies methods of calculating the theoretical quantity of outdoor air required in cargo spaces where internal combustion engines are used, in order to dilute air to within the permitted occupational exposure limits. | Yes | 15Feb'91 | 1,2,3,4 | |
| 2 | ISO | ISO 9785 | Shipbuilding; ventilation of cargo spaces where internal combustion engine vehicles may be driven; calculation of theoretical total airflow required; technical corrigendum 1 | A technical correction for ISO-9587, replaces an equation. | Yes | 15Feb'91 | 1,2,3,4 | |
| 2 | ISO | ISO 9943 | Shipbuilding; ventilation and air-treatment of galleys and pantries with cooking appliances | This standard specifies the design requirements and general considerations for the ventilation and air-treatment of galleys | Yes | 1/91 | 1,2,3,4 | |

VENTILATION

| Page 13 | WBS Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App |
|---------|-----------|-----------|---|---|---------|-----------|----------|
| | | | | and pantries with cooking appliances on board merchant vessels. | | | |
| 12 | JIS | F 2407 | Mushroom Ventilators | Specifies requirements for construction, shape, dimensions and materials for mushroom ventilators | Yes | 1970 | 1,2,3,4 |
| 12 | JIS | F 2408 | Gooseneck Ventilators | Specifies requirements for construction, shape, dimensions and materials for Gooseneck ventilators | Yes | 1974 | 1,2,3,4 |
| 12 | JIS | F 2902 | Ships' Pulkah-Louveres | Specifies requirements for construction, shape, dimensions and materials for Pulkah-Louveres used for ventilation. | Yes | 1960 | 1,2,3,4 |
| 12 | JIS | F 2902 | Ships' Pulkah-Louveres (R 1975) | Specifies requirements for construction, shape, dimensions and materials for Pulkah-Louveres used for ventilation. | Yes | 1975 | 1,2,3,4 |
| 12 | JIS | F 7113 | Marine Ventilation Dampers | Standard not available from MARAD. | | | |
| 12 | MARAD | S 38-1-31 | LOUVER | Standard no longer available. | | | |
| 12 | MARAD | S 38-1-32 | LOUVER | Standard no longer available. | | | |
| 12 | MASS | 12.10 | TRUNK, DUCT, ACCESSES TO VENTILATION EQUIPMENT AND DUCT | Standard specifies duct air velocities for air conditioning and ventilation systems. Also specifies duct construction requirements and materials. | Yes | '95 | 1,2,3,4 |
| 12 | MASS | 12..3 | CARGO HOLD VENTILATION | This section provides guidance as to requirements for ventilation for cargo spaces. Specific guidance for RO-RO type vessels is provided (with regard to CO concentration). | YES | NOV95 | 1,2,3,4 |
| 12 | MASS | 12.4 | VENTILATION OF REFRIGERATED CARGO SPACES | This section provides guidance for ventilation of refrigerated cargo spaces. Included are such things as: fan speed | YES | NOV95 | 1,2,3,4 |

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| WBS | Organ | Std-No. | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|--------------|--|---|---------|-----------|----------|
| | | | | control, insulation thickness, insulation vs sweating, etc. | | | |
| 12 | MASSD | 12.10 | TRUNK, DUCT, ACCESSES TO VENTILATION EQUIPMENT AND DUCT | Standard specifies duct air velocities for air conditioning and ventilation systems for diesel propulsion ships. Also specifies duct construction requirements and materials. | Yes | '95 | 1,2,3,4 |
| 12 | MASSD | 12.11 | VENTILATION TERMINAL, DAMPER, GRILLE AND SCREEN | Standard requires that all terminals, grilles, screens and dampers meet USPHS requirements. Also specifies ventilating requirements, installation techniques and material requirements. | Yes | '95 | 1,2,3,4 |
| 12 | NNI | NEN-ISO 7547 | Shipbuilding; Air-conditioning and ventilation of accommodation spaces on board ships; Design conditions and basis of calculations | Standard not available from MARAD. | N | 2/87 | |
| 12 | NNI | NEN-ISO 8861 | Shipbuilding; Engine-room ventilation in diesel-engined ships; Design requirements and basis of calculations | Standard not available from MARAD. | N | 3/89 | |
| 12 | NNI | NEN-ISO 8862 | Air-conditioning and ventilation of machinery control-rooms on board ships; Design conditions and basis of calculations | Standard not available from MARAD. | N | 6/87 | |
| 12 | NNI | NEN-ISO 8864 | Air-conditioning and ventilation of wheelhouse on board ships; Design conditions and basis of calculations | Standard not available from MARAD. | N | 6/87 | |
| 12 | NNI | NEN-ISO 9099 | Air-conditioning and ventilation of dry provision rooms on board ships; Design conditions and basis of calculations | Standard not available from MARAD. | N | 6/87 | |

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| <u>WBS</u> | <u>Organ</u> | <u>Std-No.</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|----------------|--|---|----------------|------------------|-----------------|
| 12 | NNI | NEN-ISO 9785 | Shipbuilding; Ventilation of cargo spaces where internal combustion engine vehicles may be driven; Calculation of theoretical total airflow required | Standard not available from MARAD. | N | 8/91 | |
| 12 | NNI | NEN-ISO 9943 | Shipbuilding; Ventilation and air-treatment of galleys and pantries with cooking appliances | Standard not available from MARAD. | N | 2/91 | |
| 12 | UL | 1136 | UL Standard for Safety Marine Rigid and Flexible Air Ducting Second Edition | This standard specifies the requirements for rigid and flexible air ducting intended to provide an air flow connection between a ventilating fitting or blower and the bilge spaces or other enclosed spaces of a ship. It includes material, and installation and construction requirements. | Yes | 7Oct'92 | 1,2,3,4 |
| 12 | UL | 441 | GAS VENTS | These requirements cover Types B and BW gas vents and Types B and BW gas vent roof jacks intended for venting gas appliances equipped with draft hoods to burn only gas. Type B vents are also intended for use with other Category I appliances that specify they are for use with Type B gas vents. CAUTION: these requirements may not be directly applicable to some marine applications. | YES | 10/7/94 | INDUSTR |
| 12 | UL | 555C | STANDARD FOR CEILING DAMPERS AND CEILING AIR DIFFUSERS | These requirements and methods of tests apply to ceiling dampers and ceiling diffusers intended for installation in hourly rated fire resistive floor-ceiling and roof-ceiling assemblies. Ceiling dampers are intended for use in sheet metal air duct outlets which penetrate the ceilings of hourly-rated fire resistant | YES | 3/31/95 | INDUSTR |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|--------|---|--|---------|-----------|----------|
| 12 | UL | 586 | HIGH-EFFICIENCY, PARTICULATE, AIR FILTER UNITS | assemblies. Construction, performance, and testing are discussed. CAUTION: some of the requirements may not be applicable to marine applications. These requirements cover high-efficiency particulate, air-filter units intended for the removal of very fine particulate matter (not less than 99.97 percent of 0.3 micron diameter particles) from the air of industrial and laboratory exhaust and ventilating systems. These requirements cover single air filter units only. Construction techniques, sizes and ratings, performance and efficiency test, etc are addressed. CAUTION: These requirements may not apply to some marine applications. | YES | 10/18/90 | INDUSTR |
| 12 | UL | 641 | TYPE LOW TEMPERATURE VENTING SYSTEMS | THESE REQUIREMENTS COVER FACTORY-BUILT VENT PIPING AND FITTINGS CONSTRUCTED TO PROVIDE VENTING SYSTEMS FOR USE WITH GAS AND LIQUID FUEL-BURNING APPLIANCES THAT EXHAUST LOW-TEMPERATURE FLUE GASES AND THAT ARE APPROVED FOR USE WITH TYPE L VENTING SYSTEMS. CONSTRUCTION TECHNIQUES, MATERIALS, ASSEMBLY, SIZES, TESTING, ETC ARE DISCUSSED. CAUTION: THESE REQUIREMENTS MAY NOT BE DIRECTLY APPLICABLE TO ALL MARINE APPLICATIONS. | YES | 12/7/95 | INDUSTR |
| 12 | UL | 680 | EMERGENCY VAULT VENTILATORS AND VAULT VENTILATING PORTS | These requirements cover emergency vault ventilators and vault-ventilating ports for installation in a wall. Emergency vault ventilators are intended to provide fresh air to persons locked in vaults by accident. | YES | 2/24/94 | INDUSTR |

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| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App |
|-----|-------|----------|---|---|---------|-----------|----------|
| 12 | UL | 705 | POWER VENTILATORS | General construction techniques and testing are discussed. CAUTION: Some of these requirements may not be applicable to marine applications. | YES | 11/2/95 | INDUSTR |
| 12 | UL | 710 | COMMERICAL ELECTRIC COOKING APPLIANCES WITH RECIRCULATING SYSTEMS | These requirements cover power ventilators of the roof and wall-mounted types and duct fans of the straight-through type intended for commercial or industrial use for connection to permanently installed wiring systems in accordance with the National Electric Code. Assembly, components, testing, etc are discussed. CAUTION: these requirements may not be applicable to some marine applications. | YES | 5/25/94 | INDUSTR |
| 12 | USCG | 46C25.40 | SUB C-REQUIREMENTS-VENTILATION | Not available from MARAD. | Yes | | |
| 12 | USCG | 46C32.55 | SUB D-SPECIAL EQUIPMENT, MACHINERY, AND HULL REQUIREMENTS-VENTILATION AND VENTING | Not available from MARAD. | Yes | | |
| 12 | USCG | 46C72.15 | CONSTRUCTION AND ARRANGEMENT-VENTILATION | Specifies ventilation requirements where liquid fuels (flashpoint of 110 deg or | Yes | 19Nov'52 | 1,2,3,4 |

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| age | 18 | | | | | | | |
|-----|-------|-----------|--|---|---------|-----------|----------|--|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | | lower) are used for main or aux machinery starting. Spaces containing such equipment shall have natural and mechanical ventilation as specified. Also specifies duct sizes, blower locations, ventilation for closed spaces and ventilation for crew and passenger spaces. | | | | |
| 12 | USCG | 46C92.15 | CONSTRUCTION AND ARRANGEMENT-VENTILATION | Specifies ventilation requirements where liquid fuels (flashpoint of 110 deg or lower) are used for main or aux machinery. Spaces containing such equipment shall have natural and mechanical ventilation as specified. Also specifies quantity of ventilation for closed spaces and ventilation for crew and passenger spaces. | Yes | 19Nov'52 | 1,2,3,4 | |
| 12 | USCG | 46C177.20 | CONSTRUCTION AND ARRANGEMENT-VENTILATION (OTHER THAN MACHINERY SPACES) | This standard specifies ventilation requirements for closed spaces including ventilation requirements for crew quarters and passenger spaces. | Yes | | 1,2,3,4 | |
| 12 | USCG | 46C190.15 | CONSTRUCTION AND ARRANGEMENT-VENTILATION | Spaces containing machinery which uses, or tanks which contain fuel with flashpoint of 110.5 deg. or lower shall have natural supply and mechanical exhaust ventilation as specified in this section. Applicable to all self-propelled vessels of greater than 300 gross tons, contracted for on or after March 1, 1968. | Yes | | 1,2,3,4 | |
| 3 | MASS | 64.01 | MACHINERY SPACE VENTILATION, VENTILATION, MACHINERY SPACE | This standard specifies machinery space ventilation requirements of a motor driven 2 speed supply and single speed exhaust fan which provides a slightly negative air pressure in the machinery space while | Yes | Draft'95 | 1,2,3,4 | |

VENTILATION

| age | 19 | | | | | | | |
|-----|-------|--------|--|--|---------|--------------|-------------|--|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| | | | | operating at normal steaming conditions while providing ventilation needs and combustion air for the boilers. | | | | |
| 13 | MASS | 64.02 | MACHINERY SPACE VENTILATION, FAN, FAN, MACHINERY SPACE VENTILATION | This standard specifies the supply and exhaust fan quantities and sizes for machinery space ventilation requirements and that the fans shall be fitted with bellmouths. | Yes | Draft'95 | 1,2,3,4 | |
| 13 | MASS | 64.03 | AIR SUPPLY, MACHINERY SPACE VENTILATION | This standard specifies fresh air supply requirements for the machinery space, including how air shall be distributed within the space, air around the boilers, and air at the operating consols and watch stations. | Yes | Draft'95 | 1,2,3,4 | |
| 13 | MASS | 64.04 | AIR EXHAUST, MACHINERY SPACE VENTILATION | This standard specifies air conditioning be provided for enclosed operating stations when the temperature is expected to exceed 104 deg. for periods in excess of 24 hours. | Yes | Draft'95 | 1,2,3,4 | |
| .3 | MASSD | 64.01 | MACHINERY SPACE VENTILATION, VENTILATION, MACHINERY SPACE | This standard specifies machinery space ventilation requirements for Diesel vessels of a motor driven 2 speed supply and single speed exhaust fan which provides a slightly negative air pressure in the machinery space while operating at normal steaming conditions while providing ventilation needs and combustion air for the boilers. | Yes | Draft'95 | 1,2,3,4 | |
| 3 | MASSD | 64.02 | MACHINERY SPACE VENTILATION, FAN, FAN, MACHINERY SPACE VENTILATION | This standard specifies the supply and exhaust fan quantities and sizes for diesel propelled machinery space ventilation requirements and that the fans shall be fitted with bellmouths. | Yes | Draft'95 | 1,2,3,4 | |

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| <u>WBS</u> | <u>Organ</u> | <u>Std-No</u> | <u>Title</u> | <u>Abstract</u> | <u>English</u> | <u>Orig Date</u> | <u>Ship App</u> |
|------------|--------------|---------------|---|---|----------------|------------------|-----------------|
| 13 | MASSD | 64.03 | AIR SUPPLY, MACHINERY SPACE VENTILATION | This standard specifies fresh air supply requirements for the diesel propelled machinery space, including how air shall be distributed within the space, air around the boilers, and air at the operating consols and watch stations. | Yes | Draft'95 | 1,2,3,4 |
| 13 | MASSD | 64.04 | AIR EXHAUST, MACHINERY SPACE VENTILATION | This standard specifies air conditioning be provided for enclosed operating stations (diesel propelled) when the temperature is expected to exceed 104 deg. for periods in excess of 24 hours. | Yes | Draft'95 | 1,2,3,4 |
| 14 | DEF S | NES 102: | Air Conditioning and Ventilation Design Issue 1 (8/83) | Standard not available from MARAD. | Yes | | |
| 14 | DEF S | NES 103 | Air Conditioning and Ventilation Installation in Ships Not to Full RN Requirements Issue 2 (1/82) | Standard not available from MARAD. | Yes | | |
| 14 | DOD | MIL-C-2939F | COOLING COILS, AIR, DUCT TYPE AND GRAVITY TYPE, NAVAL SHIPBOARD ENVIRONMENTAL CONTROL SYSTEMS | This specification covers duct type and gravity type air cooling coils for use in Naval shipboard environmental control systems. | Yes | 31Dec'90 | warship |
| 14 | MASS | 12.1 | AIR CONDITIONING, HEATING, AND VENTILATION, GENERAL | This section provides guidance for all spaces, including machinery spaces, as to air conditioning, heating and ventilation systems, including duct insulation, hangers, protection from weather, system designed to reduce airborne noise, etc. | YES | NOV95 | 1,2,3,4 |
| 14 | MASS | 12.2 | AIR CONDITIONING, HEATING AND VENTILATION, SYSTEMS | This section provides guidance on heating, ventilation and air conditioning systems. Some specifics: air conditioning design criteria, dual duct systems, terminal reheat systems, unitary air conditioning equipment, | YES | NOV95 | 1,2,3,4 |

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|------|-------|--------|--|--|---------|-----------|----------|--|
| WBS | Organ | Std-No | Title | Abstract | English | Orig Date | Ship App | |
| 14 | UL | 181A | CLOSURE SYSTEMS FOR USE WITH FLEXIBLE AIR DUCTS AND AIR CONNECTORS | heating and ventilation, ventilation and heating requirements for non-air conditioned spaces, etc. These requirements cover pressure-sensitive tapes and mastic system for use as a part of the closure system of factory-made flexible air ducts or air connectors complying with the Standard for Factory-Made Air Ducts and Air Connectors, UL181. CAUTION: these requirements may not be directly applicable to some marine applications. | YES | 3/29/95 | INDUSTR | |

SP-6 PROJECT 6-94-1 SUPPLEMENT

As a supplement to SP-6 Project 6-94-1 (Task 3), a matrix using the IHI report Volume II, Appendix IIB as the vertical column (Standard Description shown under "ITEM") and the various standard sources/organizations (identified in Task 3) as the horizontal fields was developed. This matrix was developed using Lotus 1-2-3 and both a hard copy and floppy is being provided.

The purpose of the matrix is to cross the various standards identified during the development of Task 3 to the standard descriptions identified in the IHI report. Note that the IHI ITEM standards were identified as either Short Term, Mid Term, or Long Term. This terminology is continued in the matrix.

Once the matrix was set up, the various standard numbers were entered in the appropriate blocks as applicable. Since some ITEM (Standard Description) names were applicable to numerous standard identified during development of Task 3, you may find the same standard number being using more than once. Also some ITEM names were so encompassing that numerous standards could be classified as being applicable to that ITEM name (i.e., the ITEM name "Plastic Pipe" could be applicable to all standards addressing plastic pipe).

Since numerous standards identified in Task 3 were not made available for review, in some cases a judgement as to applicability had to be made purely from a standard title. As a result, actual review of the standards may show that some entries may not be applicable to the associated ITEM standard.

TASK 6-94-1[illegible]

| ITEM | ABS | ANSI | ASTM | BSI | Bundesam | DIN | DNV | DOD | JIS | MASS | MSS | UL | USCG | ISO | ASME |
|--|-----|------|------|----------------------|--|---|-----|-----|----------------|------|-----|------|-----------|--------------|------|
| Ladders/platforms (tanks, holds) (Mid Term) | | | F840 | BSMA39-1 BSMA39-2 | | 83200 83202 83217 83218 | | | | | | | | | |
| Ladders/platforms (engine room) (Mid Term) | | | F840 | BSMA39-1 BSMA39-2 | | 83200 83202 83204 83206 83207 | | | | | | | | | |
| Ladders (accommodation) (Mid Term) | | | F840 | BSMA39-1 BSMA39-2 | VG85204 VG85207 VG85222 VG85223 | 83200 83202 | | | F2605 F2621 | 5.03 | | | | 5487 5488 | |
| Ship's side ladder for pilot (Mid Term) | | 1116 | | | | | | | F2615 F2622 | | | 1116 | | | |
| Ship's side ladders (Short Term) | | | | | | | | | F2603 | | | | | | |
| Pilot Ladders (Short Term) | | 1116 | | | | | | | F2615 F2622 | | | 1116 | | 799 657 | |
| Embarkation Ladders (Short Term) | | | | BSMA90 | | | | | F2617 | | | 1116 | 6C160.017 | 5489 5488 | |
| Inst. Std. for pilot Ladders (Short Term) | | 1116 | | | | | | | F2615 | | | 1116 | 6C163.002 | | |
| VENTILATION | | | | | | | | | | | | | | | |
| Ventilator heads (Short Term) | | | | BSMA69 | | 82341 82342 | | | F2407 F2408 | | | | | | |
| Pankah louvers (Short Term) | | | | | | | | | F2902 | | | | | 3572 | |
| Graphic sym. for vent. system (Short Term) | | | | | | | | | | | | | | 644 | |
| Vent. grills, louvers, screens, shutters (Short Term) | | | | | VG85626 | | | | | | | 586 | | | |

[illegible]

[illegible]

| ITEM | CNS | ANSI | ASTM | BSI | Bundesam | DIN | DNV | DOD | JIS | MASS | MSS | UL | USCG | ISO | FCI |
|--|----------------|---------|------------------------|-----|-------------------------------|-------|-----|-----------|--------------|-------|-----|----|----------|------|------|
| Bronze globe valve (Short Term) | | B016.15 | | | | | | | 7301 7346 | | | | | | |
| Bronze angle valve (Short Term) | F3160 F3191 | B016.15 | | | | | | | F7302 | | | | | | |
| Bronze gate valve (Short Term) | F3178 | B016.5 | | | | 86500 | | MILV1189D | | | | | | | |
| Relief valves (Short Term) | | | | | | | | | | | | | | | |
| Inspec. std. non-ferrous pipe mat'l. (Short Term) | | | | | | | | | | | | | | | |
| Inspec. std. plastic pipe mat'l. (Short Term) | | | SEE PLASTIC PIPE | | | | | | | | | | | | |
| Accuracy std. for pipe flanges (Short Term) | | B016.5 | | | | | | | | | | | | | |
| Design std. fire ext. piping system (Mid Term) | | | | | | | | | | 58.06 | | | 46C76.10 | 3926 | |
| Insp. std. fire ext. piping system (Mid Term) | | | | | | | | | | | | | | | |
| Design std fire prevention/safety req (Long Term) | | | | | | | | | | | | | | | |
| Steam trap (Long Term) | | | | | | | | | | | | | | | 69-1 |
| Special Valves (Long Term) | | F1370 | | | VG85380 VG85523 VG85053 | | | | F7371 | | | | | | |

[illegible]

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